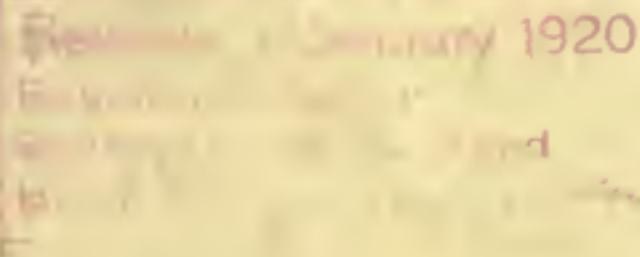


# BOILERS AND RADIATORS



*The* H. B. SMITH CO.

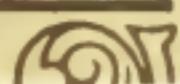


WESTFIELD MASS

NEW YORK

BOSTON

PHILADELPHIA



Date 1/23

No. 13

Dr. J.







The  
**H. B. SMITH CO.**  
WESTFIELD, MASS.

10 East 39th Street  
NEW YORK

17th and Arch Sts.  
PHILADELPHIA

138 Washington Street North  
BOSTON

---

Pacific Coast Representatives:  
HOLBROOK, MERRILL & STETSON  
SAN FRANCISCO,  
LOS ANGELES, CAL.

---

BOILERS USED EXCLUSIVELY FOR LOW PRESSURE STEAM AND HOT WATER HEATING AND HOT WATER SUPPLY

---

**BOILER AND RADIATOR  
CATALOGUE NO. 1146**  
(Superseding No. 990)

1919



## CONTENTS

### Boilers

	PAGE
BOILER RATING.....	4
Mills Water Tube Boiler.....	5
Smith Boiler.....	17
H-B Boiler.....	35
Menlo Boiler.....	41
Smith Service Boiler W-17.....	44
Mercer Return Flue Boiler.....	47
Hot Water Supply Fittings.....	53

### Direct Radiators

#### PRINCESS

Single-Column.....	61
Two-Column.....	62
Three-Column.....	63
Five-Column.....	64
Wall Radiator.....	67
Regular Tapping.....	80

3

### Special Radiators

Brackets (Concealed).....	77
Foot Rests.....	78
Special Legs .....	78

3

### Indirect Radiators

Aerial.....	85
Gold Pin.....	81
School Pin.....	84

### Automatic Air Valves

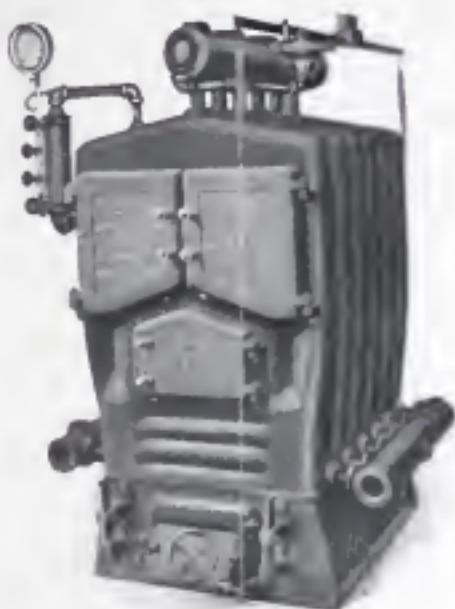
Breckenridge.....	86
-------------------	----

## BOILER RATING

### Basis for Computing Size of Boilers

1. STEAM BOILER ratings are based on maintaining two pounds pressure at the boiler.
2. WATER BOILER ratings are based on the water being maintained at a temperature of 180 degrees at the boiler.
3. SUFFICIENT RADIATION must be installed to easily raise and maintain a temperature of 70 degrees.
4. RATINGS are for cast-iron DIRECT radiators with average amount of surface in MAINS, RISERS and RETURNS.
5. Usual allowance must be made for the use of PIPE COILS, WALL RADIATORS, DIRECT-INDIRECT RADIATORS, INDIRECT RADIATION and CONTINGENCIES.
  - (a) PIPE COILS or WALL RADIATORS. Each foot of surface is considered equivalent to  $1\frac{1}{4}$  feet of direct radiation.
  - (b) DIRECT-INDIRECT RADIATORS. Each foot of surface is considered equivalent to  $1\frac{3}{8}$  feet of direct radiation.
  - (c) INDIRECT RADIATION in a GRAVITY SYSTEM. Each foot of surface is considered equivalent to 2 feet of direct radiation.
  - (d) INDIRECT RADIATION in a FAN SYSTEM. Each pound of steam condensed per hour is equivalent to 4 feet of direct steam radiation.
  - (e) COIL WATER BACK or OTHER FITTINGS for HEATING WATER for HOT WATER SUPPLY. Each gallon storage capacity is considered equivalent to 2 feet of direct steam radiation or 3 feet of direct water radiation.
6. ALL MAINS (supplies, returns, risers, etc.) are to be figured as radiating surface.
  - (a) Under average conditions the allowance for mains, etc., may be considered equal to approximately 50% of the NET amount of DIRECT radiation. (See paragraph 5.)
7. LISTED RATINGS of boilers are determined by adding 50% to the NET amount of DIRECT cast-iron RADIATION exclusive of mains, etc. (See paragraph 5.)
  - (a) The above 50% addition is equivalent to a deduction of  $33\frac{1}{3}\%$  from listed ratings.
8. RATINGS of all boilers except those with SMOKELESS FURNACES are based on ANTHRACITE COAL as fuel.
  - (a) If BITUMINOUS COAL is to be used with boilers that are rated for ANTHRACITE COAL, it is good practice to add about 10% to size of boiler.
9. RATINGS of SMITH BOILERS with SMOKELESS FURNACES are based on bituminous coal as fuel.

## No. 24 Mills Water Tube Boiler



No. 24 Steam Boiler

## COMMERCIAL RATINGS

Number of Sections	Nominal Size of Fire Pot inches	Fire (Heating) Surface sq. ft.	Steam Rating* feet	Water Rating* feet
5	24 x 24	75.5	900	1500
6	24 x 30	91.0	1125	1875
7	24 x 36	106.5	1350	2250
8	24 x 42	122.0	1575	2600
9	24 x 48	137.5	1800	2975
10	24 x 54	153.0	2025	3350

Total height 66 in.

Total width Steam Boiler 45 in.

Height of Water Line 47 in.

Total width Water Boiler 48 in.

## No. 24 Mills Boilers

### NO. 24 MILLS WATER TUBE BOILER

Maximum Allowable Working Pressure—Steam 15 lb., Water 50 lb.  
Tested to A.S.M.E. Standard Hydrostatic Pressure

#### DIMENSIONS

Number of Sections	Nominal Size of Fire Pot inches	Total Length of Boiler inches	Length of Fire Pot inches	Length at Foundation inches	Diam. Smoke Pipe Opening inches
5	24 x 24	48	24	32	9
6	24 x 30	54	30	38	9
7	24 x 36	60	36	44	10
8	24 x 42	66	42	50	10
9	24 x 48	72	48	56	12
10	24 x 54	78	54	62	12

Width at Foundation	29	in.
Width of Sections	32	in.
Width of Boiler, STEAM	45	in.
Width of Boiler, WATER	48	in.
Height of Boiler	66	in.
Height of Water Line	47	in.
Height of Ash Pit	12	in.
Length of Grate Bars	20	in.
Distance between Center of Grates	6	in.
6 Outside Diameter of Supply Drum	6	in.
Outside Diameter of Return Drums, STEAM	4 $\frac{1}{2}$	in.
Outside Diameter of Return Drums, WATER	6	in.
Size of Supply Drum Nipples	1 $\frac{1}{2}$ in. x 4 $\frac{1}{2}$ in.	
Size of Return Drum Nipples	1 $\frac{1}{2}$ in. x 6 in.	
Distance from floor to underside of Smoke-Pipe	19	in.

#### SAFETY VALVE AND WATER RELIEF VALVE SIZES A.S.M.E. Standard

Number of Sections in Boiler	Size of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15	0-25	25-50
			Size Steam Safety Valve, in.	Size Water Relief Valves inches	
5	20 x 24	3.33	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$
6	20 x 30	4.17	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$
7	20 x 36	5.00	2	2	1 $\frac{1}{2}$
8	20 x 42	5.84	2	2	2
9	20 x 48	6.67	2	2	2
10	20 x 54	7.50	2	2	2

#### RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys are required.					
	Diam. inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
5	11	75	12	50	13	25
6	11	75	12	50	14	25
7	12	75	13	50	15	25
8	13	75	14	50	16	30
9	13	75	14	50	16	30
10	14	75	15	50	16	30

NO. 24 MILLS WATER TUBE BOILER  
REGULAR TAPPINGS \*

## SUPPLY DRUM

Outside diameter.....	6 in.
Tapped for 1½ in. Lock-Nut Nipples	
Ends tapped.....	2½ in.

## TAPPINGS ON TOP

Number of Sections	Size of Tappings, in.				
	1½	1¾	2	2½	3
Ste'm Wat'r	No. of Tappings				
5	5	1	2	1	
6	6		2	1	
7	7		2	1	
8	8		2	1	1
9	9		1	1	1
10	10		1	1	1
			1	1	1

## RETURN DRUMS

STEAM BOILERS:	
Outside Diameter.....	4½ in.
Tapped for 1½ in. Lock-Nut Nipples	
Top and bottom at opposite ends tapped.....	2 in.
Ends tapped.....	2½ in.
Side tapped.....	1½ in.

## WATER BOILERS:

Outside diameter .....	6 in.
Tapped for 1½ in. Lock-Nut Nipples	
Top and bottom at opposite ends tapped.....	2 in.
Side tapped.....	1½ in.
Front ends tapped.....	2½ in.
5 to 8 sections:	
Rear ends tapped.....	4 in.
9 and 10 sections:	
Rear ends tapped.....	5 in.

## FIRE TOOLS FURNISHED

Ash shovel, poker, flue brush and handle.

## TRIMMINGS FURNISHED FOR STEAM BOILERS

Steam gauge with cock.

Water column complete, including two ¾ in. gauge cocks, with pair of ½ in. water-gauge cocks and glass. Damper regulator complete with chain.

Pipe and fittings for connecting steam trimmings.

## ASBESTOS PLASTER

Plaster is furnished in order that the joints between the sections can be made and the boiler fired before covering the boiler complete. A sufficient amount of plaster is furnished for this purpose only.

## DRAFT DISTRIBUTERS

The draft distributers in the side flues under average conditions should be turned to horizontal positions (flat across flues). In this position they do not diminish the area of the flues. If boiler is connected to a poor chimney, turn draft distributers to vertical positions.

\* TAPPINGS other than those listed are SPECIAL. Order must SPECIFY SIZES.

## No. 34 Mills Water Tube Boiler



8

No. 34 Water Boiler

### COMMERCIAL RATINGS

Number of Sections	Nominal Size of Fire pot inches	Fire (Heating) Surface sq. ft.	Steam Rating *feet	Water Rating *feet
6	34 x 30	165.0	2000	3300
7	34 x 36	192.5	2400	3950
8	34 x 42	220.0	2800	4625
9	34 x 48	247.5	3200	5275
10	34 x 54	275.0	3600	5950
11	34 x 60	302.5	4000	6600
12	34 x 66	330.0	4400	7250
13	34 x 72	357.5	4800	7925
14	34 x 78	385.0	5200	8575

Total Height 78 in.

Total Width 51 in.

Height of Water Line 54 in.

\* FOR COMPUTING SIZE OF BOILER, SEE PAGE 4.

## NO. 34 MILLS WATER TUBE BOILER

Maximum Allowable Working Pressure—Steam 15 lb., Water 50 lb.

Tested to A.S.M.E. Standard Hydrostatic Pressure.

## DIMENSIONS

Number of Sections	Nominal Size of Fire Pot inches	Total Length of Boiler inches	Length of Fire Pot at Fnd'tn inches	Length at Fnd'tn inches	Size of Smoke Pipe Opening inches
6	34 x 30	60	30	37	10 x 14 = 12 Round
7	34 x 36	66	36	43	10 x 14 = 12 "
8	34 x 42	72	42	49	10 x 14 = 12 "
9	34 x 48	78	48	55	10 x 18 = 14 "
10	34 x 54	84	54	61	10 x 18 = 14 "
11	34 x 60	90	60	67	10 x 18 = 14 "
12	34 x 66	96	66	73	12 x 20 = 16 "
13	34 x 72	102	72	79	12 x 20 = 16 "
14	34 x 78	108	78	85	12 x 20 = 16 "

Width at Foundation.....	36	in.
Width of Boiler.....	51	in.
Height of Boiler.....	78	in.
Height of Water Line.....	54	in.
Height of Ash Pit.....	16	in.
Length of Grate Bars.....	28	in.
Distance between Center of Grates.....	6	in.
Outside Diameter of Supply Drum.....	8	in.
Outside Diameter of Return Drums, STEAM.....	4½	in.
Outside Diameter of Return Drums, WATER.....	6	in.
Size of Supply Drum Nipples.....	2 in. x 4½	in.
Size of Return Drum Nipples.....	1½ in. x 7	in.
Distance from floor to Smoke-Pipe Opening.....	42	in.

## RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys are required.					
	Diam. inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
6	14	75	15	50	16	30
7	15	80	16	50	17	30
8	15	80	17	50	19	30
9	16	80	18	50	20	30
10	17	80	18	60	20	35
11	17	90	18	65	20	40
12	18	90	19	65	21	40
13	19	90	20	65	22	40
14	19	90	20	65	23	40

SAFETY VALVE AND WATER RELIEF VALVE SIZES  
A.S.M.E. Standard

Number of Sections in Boiler	Size of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15		0-25
			Size Steam Safety Valve, in.	Size Water Relief Valves inches	25-50
6	28 x 30	5.83	2	2	2
7	28 x 36	7.00	2	2	2
8	28 x 42	8.17	2½	2½	2
9	28 x 48	9.33	2½	2½	2
10	28 x 54	10.50	2½	2½	2½
11	28 x 60	11.67	2½	2½	2½
12	28 x 66	12.83	3	3	2½
13	28 x 72	14.00	3	3	2½
14	28 x 78	15.17	3	3	3

## No. 34 Mills Boilers

### NO. 34 MILLS WATER TUBE BOILER

#### REGULAR TAPPINGS \*

##### SUPPLY DRUM

Outside diameter..... 8 in.  
Tapped for 2 in. Lock-Nut Nipples  
Each end tapped..... 2½ in.

##### TAPPINGS ON TOP

Number of Sections	Ste'm Wat'r	Size of Tappings, in.					No. of Tappings
		2	2½	3	4	5	
6	6	1		2	1		
7	7	1		2	1		
8	8	1		2	1		
9	9		1	1	1	1	
10	10		1	1	1	1	
11	11		1	1	1	1	
12	12		1	1	1	1	
13	13			1	2	1	
14	14			1	2	1	
14				1	2	1	

##### RETURN DRUMS

STEAM BOILERS:  
Outside diameter..... 4½ in.  
Tapped for 1½ in. Lock-Nut  
Nipples  
Side tapped..... 2 in.  
Under side tapped..... 1½ in.  
6-10 sections:  
Each end tapped..... 2½ in.  
11-14 sections:  
Front ends tapped..... 2½ in.  
Rear ends tapped..... 3 in.

WATER BOILERS:  
Outside diameter..... 6 in.  
Tapped for 1½ in. Lock-Nut  
Nipples  
Under side tapped..... 1½ in.  
6-8 sections:  
Front ends tapped..... 2½ in.  
Rear ends tapped..... 4 in.  
Side tapped..... 2 in.  
9-12 sections:  
Front ends tapped..... 2½ in.  
Rear ends tapped..... 5 in.  
Side tapped..... 2 in.  
13 and 14 sections:  
Front ends tapped, one 2½,  
one 5 in.  
Rear ends tapped, one 2½, one  
5 in.  
Side tapped, one 4, one 2 in.

#### 10 FIRE TOOLS FURNISHED

Ash shovel, poker, flue brush and  
handle.

#### TRIMMINGS FURNISHED FOR STEAM BOILERS

Steam gauge with cock. Water column complete, including two  
½ in. gauge cocks, with pair ½ in. water gauge cocks and glass.  
Damper regulator complete with chain. Pipe and fittings for connecting  
steam trimmings.

#### ASBESTOS PLASTER

Plaster is furnished in order that the joints between the sections  
can be made and the rear of the extreme back section covered so  
that the boiler may be fired before covering the boiler complete.

At the base of each section, and forming the sides of the fire pot,  
are pockets which are to be filled with asbestos plaster. These pockets  
should be filled as the sections are placed in position. A sufficient  
amount of the plaster is furnished for these purposes only.

#### DRAFT DISTRIBUTERS

The draft distributors in the side flues, under average conditions,  
should be turned to horizontal positions (flat across flues). In this  
position they do not diminish the area of the flues. If boiler is connected  
to a poor chimney, turn draft distributors to vertical positions.

\* TAPPINGS other than those listed are SPECIAL. Order must  
SPECIFY SIZES.

## No. 44 Mills Water Tube Boiler



11

Interior

No. 44 Boiler

## COMMERCIAL RATINGS

Number of Sections	Nominal Size of Fire Pot	Fire (Heating) Surface	Steam	Water
			Rating*	Rating*
	inches	sq. ft.	feet	feet
7	44 x 36	287	3600	5950
8	44 x 42	328	4200	6925
9	44 x 48	369	4800	7925
10	44 x 54	410	5400	8900
11	44 x 60	451	6000	9900
12	44 x 66	492	6600	10900
13	44 x 72	533	7200	11875
14	44 x 78	574	7800	12875
15	44 x 84	615	8400	13850
16	44 x 90	656	9000	14850

Total Height, 75 in.

Total Width, 64 in.

Height of Water Line 58 in.

\* FOR COMPUTING SIZE OF BOILER SEE PAGE 4.

## No. 44 Mills Boilers

### NO. 44 MILLS WATER TUBE BOILER

Maximum Allowable Working Pressure—Steam 15 lb., Water 50 lb.

Tested to A.S.M.E. Standard Hydrostatic Pressure

#### DIMENSIONS

Number of Sections	Nominal Size of Fire Pot inches	Total Length Boiler inches	Length of Fire Pot inches	Length at Fnd'tn inches	Size of Smoke Pipe, Opening inches
7	44 x 36	72	36	43	13x16 $\frac{3}{8}$ = 15 round
8	44 x 42	78	42	49	13x16 $\frac{3}{8}$ = 15 "
9	44 x 48	84	48	55	13x16 $\frac{3}{8}$ = 15 "
10	44 x 54	90	54	61	13x22 $\frac{1}{8}$ = 18 "
11	44 x 60	96	60	67	13x22 $\frac{1}{8}$ = 18 "
12	44 x 66	102	66	73	13x22 $\frac{1}{8}$ = 18 "
13	44 x 72	108	72	79	15x24 $\frac{1}{2}$ = 20 "
14	44 x 78	114	78	85	15x24 $\frac{1}{2}$ = 20 "
15	44 x 84	120	84	91	15x24 $\frac{1}{2}$ = 20 "
16	44 x 90	126	90	97	15x24 $\frac{1}{2}$ = 20 "

Width at Foundation	46 in.	Height of Ash Pit...	16 in.
Width of Boiler.....	64 in.	Length of Grate Bar.....	38 in.
Height of Boiler.....	75 in.	Size of Supply Drum Nipples 2 in. x 4 $\frac{1}{4}$ in.	
Height of Water Line	58 in.	Size of Return Drum Nipples 2 in. x 7 in.	
Distance between Center of Grates .....			6 in.
Outside Diameter of Supply Drum.....			10 in.
Outside Diameter of Return Drums, STEAM.....			6 in.
Outside Diameter of Return Drums, WATER.....			8 in.
Distance from floor to Smoke-Pipe Opening.....			50 in.

#### SAFETY VALVE AND WATER RELIEF VALVE SIZES

A.S.M.E. Standard

Number of Sections in Boiler	Size of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15		Size Water Relief Valves inches
			Size Steam Safety Valve in	0-25	
7	38 x 36	9.50	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2
8	38 x 42	11.10	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
9	38 x 48	12.70	3	3	2 $\frac{1}{2}$
10	38 x 54	14.25	3	3	2 $\frac{1}{2}$
11	38 x 60	15.80	3	3	3
12	38 x 66	17.40	3	3	3
13	38 x 72	19.00	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3
14	38 x 78	20.60	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3
15	38 x 84	22.20	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$
16	38 x 90	23.75	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$

#### RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys are required.					
	Diam. inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
7	17	75	18	55	20	35
8	18	75	20	45	21	35
9	19	80	20	60	21	45
10	20	75	21	55	23	40
11	20	90	21	70	24	40
12	21	85	22	70	24	45
13	21	100	23	65	25	45
14	22	100	24	60	26	45
15	23	90	24	70	26	45
16	23	100	25	65	27	45

NO. 44 MILLS WATER TUBE BOILER  
REGULAR TAPPINGS \*

## SUPPLY DRUM

Outside diameter, ..... 10 in.  
Tapped for 2 in. Lock-Nut Nipples  
Front end tapped, ..... 2½ in.  
Rear end tapped, one 2½ in. and  
one 2 in.

## TAPPINGS ON TOP

Num- ber of Secs.	Size of Tappings, inches						
	2½	3	3½	4	5	6	7
Number of Tappings							
7	1	1		1	1		
8	1	1		1	1		
9		1		1	1	1	
10		1		1	1	1	
11		1		1	1	1	
12		1		1	1	1	
13			1		1	1	1
14			1		1	1	1
15			1		1	1	1
16			1		1	1	1

## RETURN DRUMS

## STEAM BOILERS:

Outside diameter, ..... 6 in.  
Tapped for 2 in. Lock-Nut Nipples  
Front ends tapped, ..... 2½ in.  
Sides tapped, ..... 2 in.  
Under side tapped, ..... 1½ in.  
Rear ends tapped:  
7 and 8 sections ..... 2½ in.  
9 to 16 sections, ..... 3 in.

## WATER BOILERS:

Outside diameter, ..... 8 in.  
Tapped for 2 in. Lock-Nut Nipples  
7 to 11 sections:  
Front ends tapped, one 2½,  
one 5 in.  
Rear ends tapped, one 2½, one  
5 in.  
Side tapped, ..... 5 in.  
12 to 16 sections:  
Front ends tapped, one 2½,  
one 6 in.  
Rear ends tapped, one 2½, one  
6 in.  
Side tapped, ..... 6 in.

13

## FIRE TOOLS FURNISHED

Ash shovel, hoe, poker, flue brush and handle.

## TRIMMINGS FURNISHED FOR STEAM BOILERS

Steam gauge with cock. Water column complete, including two  $\frac{3}{4}$  in. gauge cocks, with pair of  $\frac{3}{8}$  in. water-gauge cocks and glass. Damper Regulator complete with chain. Pipe and fittings for connecting steam trimmings.

## ASBESTOS PLASTER

Plaster is furnished in order that the joints between the sections can be made and the rear of the extreme back section covered so that the boiler may be fired before covering the boiler complete.

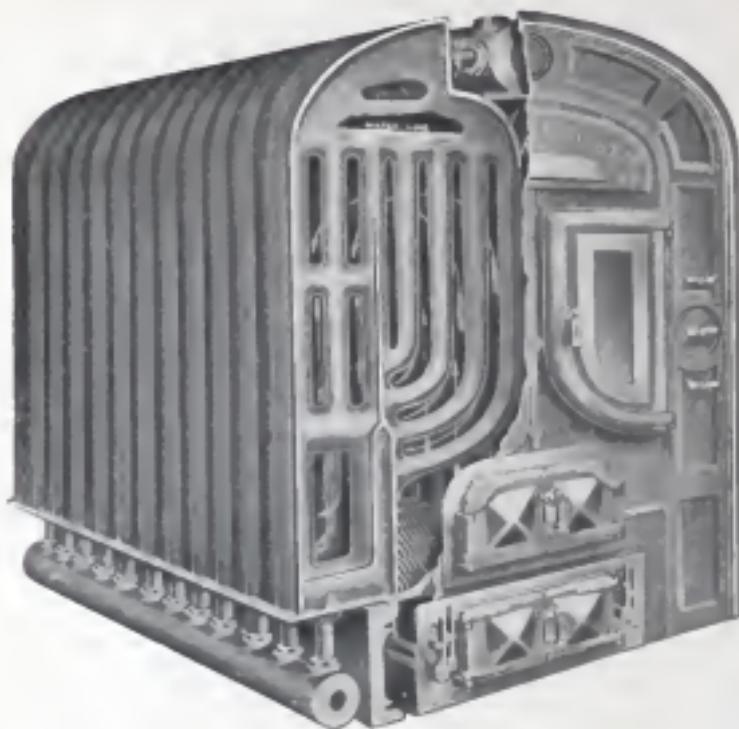
At the base of each section, and forming the sides of the fire pot, are pockets which are to be filled with asbestos plaster. These pockets should be filled as the sections are placed in position. A sufficient amount of the plaster is furnished for these purposes only.

## DRAFT DISTRIBUTERS

The draft distributors in the side flues, under average conditions, should be turned to horizontal positions (flat across flues). In this position they do not diminish the area of the flues. If boiler is connected to a poor chimney, turn draft distributors to vertical positions.

\* TAPPINGS other than those listed are SPECIAL. Order must SPECIFY SIZES.

## No. 48 Mills Water Tube Boiler



14

No. 48 Boiler

## COMMERCIAL RATINGS

Number of Sections	Nominal Size of Fire Pot inches	Fire (Heating) Surface sq. ft.	Steam Rating* feet	Water Rating* feet
7	48 x 30	360	4800	7925
8	48 x 36	420	5600	9250
9	48 x 42	480	6400	10550
10	48 x 48	540	7200	11875
11	48 x 54	600	8000	13200
12	48 x 60	660	8800	14525
13	48 x 66	720	9600	15850
14	48 x 72	780	10400	17150
15	48 x 78	840	11200	18475
16	48 x 84	900	12000	19800
17	48 x 72†	960	12800	21125
17	48 x 90†	960	12800	21125
18	48 x 78	1020	13600	22450
18	48 x 96†	1020	13600	22450

Total Height, 103 in.

Total Width, 84 in.

Height of Water Line 84 in.

\*FOR COMPUTING SIZE OF BOILER, SEE PAGE 4

† Maximum size of fire pot, not shipped as regular.

## NO. 48 MILLS WATER TUBE BOILER

Maximum Allowable Working Pressure—Steam 15 lb., Water 80 lb.  
Tested to A.S.M.E. Standard Hydrostatic Pressure

## DIMENSIONS

Number of Sections	Nominal Size of Fire Pot inches	Total Length of Boiler inches	Length of Fire Pot inches	Length at Fnd'tn inches	Size of Smoke Pipe, Opening inches
7	48 x 30	74	30	43	16 round
8	48 x 36	80	36	49	16 "
9	48 x 42	86	42	55	16 "
10	48 x 48	92	48	61	16 "
11	48 x 54	98	54	67	16x23 $\frac{3}{4}$ = 20 round
12	48 x 60	104	60	73	16x23 $\frac{3}{4}$ = 20 "
13	48 x 66	110	66	79	16x23 $\frac{3}{4}$ = 20 "
14	48 x 72	116	72	85	16x23 $\frac{3}{4}$ = 20 "
15	48 x 78	122	78	91	16x23 $\frac{3}{4}$ = 20 "
16	48 x 84	128	84	97	16x31 $\frac{1}{2}$ = 24 "
17	48 x 72	134	72	103	16x31 $\frac{1}{2}$ = 24 "
17	48 x 90*	134	90	103	16x31 $\frac{1}{2}$ = 24 "
18	48 x 78	140	78	109	16x31 $\frac{3}{4}$ = 24 "
18	48 x 96*	140	96	109	16x31 $\frac{3}{4}$ = 24 "

Width of Ash Pit.....	60	in.
Width of Twin Sections.....	82 $\frac{3}{4}$	in.
Width of Boiler.....	84	in.
Height of Boiler.....	103	in.
Height of Water Line.....	84	in.
Height of Ash Pit.....	18	in.
Length of Grate Bar.....	48	in.
Distance between Center of Grates.....	6	in.
Outside Diameter Supply Drum.....	12	in.
Outside Diameter Return Drums.....	8	in.
Size of Supply Drum Nipples.....	2 in. x 6	in.
Size of Return Drum Nipples.....	2 in. x 9	in.
Distance from floor to Smoke Pipe Opening.....	58	in.

## RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys are required					
	Diam. inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
7	19	80	20	60	22	40
8	20	80	21	60	23	40
9	21	80	23	60	24	40
10	22	80	24	60	26	40
11	23	90	24	65	27	40
12	23	90	25	65	27	45
13	24	90	25	75	27	50
14	25	100	26	75	29	50
15	26	100	27	75	29	50
16	26	100	28	75	30	50
17	27	100	28	80	31	50
18	28	100	29	80	32	50

\* Maximum size of Fire Pot, not shipped as regular.

No. 48 Mills Boilers

NO. 48 MILLS WATER TUBE BOILER  
SAFETY VALVE AND WATER RELIEF VALVE SIZES  
A. S. M. E. Standard

Number of Sections in Boiler	Size of Grate	Area of Grate	Working Pressure in lb. per sq. in.			
			0-15	0-25	25-50	50-80
			Size Steam Safety Valve, inches	Size Water Relief Valves	inches	
	inches	sq. ft.				
7	48 x 30	10	2 1/2	2 1/2	2 1/2	2
8	48 x 36	12	2 1/2	2 1/2	2 1/2	2 1/2
9	48 x 42	14	3	3	2 1/2	2 1/2
10	48 x 48	16	3	3	3	2 1/2
11	48 x 54	18	3 1/2	3 1/2	3	3
12	48 x 60	20	3 1/2	3 1/2	3	3
13	48 x 66	22	3 1/2	3 1/2	3	3
14	48 x 72	24	3 1/2	3 1/2	3	3
15	48 x 78	26	4	4	3 1/2	3 1/2
16	48 x 84	28	4	4	3 1/2	3 1/2
17*	48 x 72*	24	3 1/2	3 1/2	3 1/2	3
17	48 x 78	26	4	4	3 1/2	3 1/2
17	48 x 90	30	4	4	4	3 1/2
18*	48 x 78*	26	4	4	3 1/2	3 1/2
18	48 x 84	28	4	4	3 1/2	3 1/2

16

REGULAR TAPPINGS \*\*

TAPPINGS ON TOP OF SUPPLY DRUM

Num- ber of Secs.	Size of Tappings, inches					
	2 1/2	3	3 1/2	4	6	8
	Number of Tappings					
7	1	1	.	.	2	.
8	1	1	.	.	2	.
9	.	2	.	.	1	1
10	.	2	.	.	1	1
11	.	.	2	.	.	2
12	.	.	2	.	.	2
13	.	.	2	.	.	2
14	.	.	2	.	.	2
15	.	.	2	.	.	2
16	.	.	2	.	.	2
17	.	.	2	.	.	2
18	.	.	2	.	.	2

SUPPLY DRUM

Outside diameter.....12 in.  
Tapped for 2 in. Lock-Nut Nipples  
Rear end tapped, one  
4 in and one 2 in.

For tappings on top of drum,  
see table at left.

RETURN DRUMS †

Outside diameter.....8 in.  
Tapped for 2 in. Lock-Nut Nipples  
Rear ends tapped.....4 in.  
Undersides tapped.....1 1/4 in.

FIRE TOOLS FURNISHED

Ash shovel, hoe, poker, flue brush  
and handle.

TRIMMINGS FURNISHED FOR STEAM BOILERS

Steam gauge with cock and siphon. Water column complete,  
including three 3/4 in. gauge cocks, 3/4 in. water-gauge cocks and  
glass. Damper regulator complete with chain. Steam jet and hose.

ASBESTOS PLASTER

Plaster is furnished in order that the joints between sections can be  
made and the rear of the extreme back section covered so that the  
boiler may be fired before covering the boiler complete.

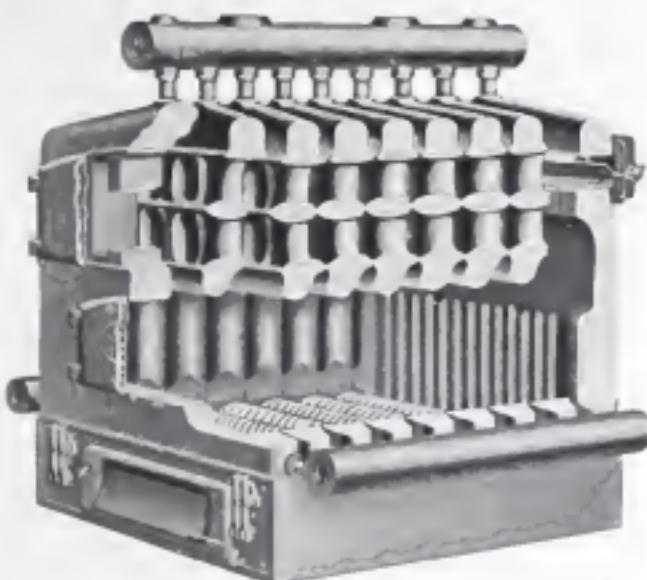
At the base of each section, and forming the sides of the fire pot,  
are pockets which are to be filled with asbestos plaster. These pockets  
should be filled as the sections are placed in position. A sufficient  
amount of the plaster is furnished for these purposes only.

\* Size of grate shipped unless otherwise specified.

\*\* Tappings other than those listed are special. Order must specify sizes.

† When Boiler is to be used for water heating, specify on order the  
size of supply and return pipe tappings.

**No. 27 Smith Boiler**  
**without**  
**Smokeless Furnace**



Nos. 27 and 36 Smith Boiler without Smokeless Furnace

**COMMERCIAL RATINGS FOR BOILERS  
 WITHOUT SMOKELESS FURNACE**

Number of Sections in Boiler	Nominal Size of Fire Pot inches	Fire (Heating) Surface sq. ft.	Steam Rating* feet	Water Rating * feet
5	27 x 24	67.5	1200	1975
6	27 x 30	81.5	1500	2475
7	27 x 36	95.5	1800	2975
8	27 x 42	109.5	2100	3475
9	27 x 48	123.5	2400	3950
10	27 x 54	137.5	2700	4450
11	27 x 60	151.5	3000	4950
12	27 x 60	172.5	3300	5450
12	27 x 66†	165.5	3300	5450
13	27 x 66	186.5	3600	5950
13	27 x 72†	179.5	3600	5950
14	27 x 66	200.5	3900	6425
14	27 x 78†	193.5	3900	6425

Total height 80 in.

Height of Water Line 57 in.

Total width, Steam Boiler 56 in.

Total width, Water Boiler 59 in.

\* FOR COMPUTING SIZE OF BOILER SEE PAGE 4.

† Maximum size of Fire Pot, not shipped as regular.

No. 27 Smith Boilers

NO. 27 SMITH BOILER  
WITHOUT  
SMOKELESS FURNACE

Maximum Allowable Working Pressure—Steam 15 lb., Water 30 lb.  
Tested at 60 lb. per sq. in. Hydrostatic Pressure, A.S.M.E. Standard

DIMENSIONS

Number of Sections in Boiler	Size of Fire Pot inches	Total Length of Boiler inches	Length at Founda- tion inches	Length of Fire Pot inches	Size of Smoke Pipe Opening inches
5	27 x 24	47	32	24	
6	27 x 30	53	38	30	
7	27 x 36	59	44	36	
8	27 x 42	65	50	42	
9	27 x 48	71	56	48	12 x 15
10	27 x 54	77	62	54	oval
11	27 x 60	83	68	60	equals
12	27 x 60	89	74	60	13 $\frac{1}{4}$ round
	27 x 66*	89	74	66	
13	27 x 66	95	80	66	
13	27 x 72*	95	80	72	
14	27 x 66	101	86	66	
14	27 x 78*	101	86	78	

18	Width at foundation.....	35 in.	Dist. betw. centers of grate bars	6	in.
	Width of boiler, steam	56 in.	Outside diameter supply drum	8	in.
	Width of boiler, water	59 in.	Outside dia. ret. drum, steam	4 $\frac{1}{4}$	in.
	Height of boiler.....	80 in.	Outside dia. ret. drum, water	6	in.
	Height of water line.....	57 in.	Size of supply drum nipples	2 in. x 6 in.	
	Height of ash pit.....	16 in.	Size ret. drum nipples	1 $\frac{1}{2}$ in. x 6 in.	
	Length of grate bar.....	27 in.	Distance from floor to center of smoke pipe opening.....	55	in.

SAFETY AND WATER RELIEF VALVE SIZES  
A.S.M.E. Standard

Number of Sections in Boiler	Size of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15 Size Steam Safety Valve, inches	0-25	25-30
			Size Water Relief Valves inches		
5	27 x 24	4.50	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$
6	27 x 30	5.63	2	2	2
7	27 x 36	6.75	2	2	2
8	27 x 42	7.88	2	2	2
9	27 x 48	9.00	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2
10	27 x 54	10.13	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
11	27 x 60	11.25	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
12†	27 x 60†	11.25	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
12	27 x 66	12.38	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
13†	27 x 66†	12.38	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
13	27 x 72	13.50	3	3	2 $\frac{1}{2}$
14†	27 x 66†	12.38	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
14	27 x 72	13.50	3	3	2 $\frac{1}{2}$
14	27 x 78	14.63	3	3	2 $\frac{1}{2}$

\* Maximum size of Fire Pot; not shipped as regular.

† Size of Grate shipped unless otherwise specified.

NO. 27 SMITH BOILER  
WITHOUT  
SMOKELESS FURNACE  
REGULAR TAPPINGS \*

## SUPPLY DRUM

Outside diameter..... 8 in.  
Each end tapped..... 2½ in.  
Tapped for 2 in. Lock-Nut Nipples  
NUMBER OF TAPPINGS ON TOP OF DRUM

Number of Boiler Sections	Size of Tappings in Inches					
	Ste'm Wat'r	2	2½	3	4	5
5	5	1	.	2	1	.
5	6	1	.	2	1	.
6	7	1	.	2	1	.
7	8	1	.	2	1	.
8	9	.	1	1	1	1
9	10	.	1	1	1	1
10	11	.	1	1	1	1
11	12	.	1	1	1	1
12	13	.	.	1	2	1
13	14	.	.	1	2	1
14	.	.	.	1	2	1

## RETURN DRUMS

STEAM BOILERS:  
Outside diameter..... 4½ in.  
Tapped for 1½ in. Lock-Nut  
Nipples  
Top and bottom at opposite  
ends tapped..... 2 in.  
Sides tapped..... 1¼ in.  
Front ends tapped..... 2½ in.  
Rear ends tapped:  
5 to 10 sections..... 2½ in.  
11 to 14 sections..... 3 in.

WATER BOILERS:  
Outside diameter..... 6 in.  
Tapped for 1½ in. Lock-Nut  
Nipples  
Tapped underside..... 2 in.  
Sides tapped..... 1¼ in.  
Front ends tapped..... 2½ in.  
Rear ends tapped:  
5 to 8 sections..... 4 in.  
9 to 12 sections..... 5 in.  
13 and 14 sections, one 2½ in  
and one 5 in.  
Top tapped:  
5 to 12 sections..... 2 in.  
13 and 14 sections, one 2 in.  
and one 4 in.

19

## RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys are required.					
	Diameter inches	Height feet	Diam- eter inches	Height feet	Diam- eter inches	Height feet
5	12	75	13	50	13	35
6	12	75	13	50	14	35
7	13	75	14	50	15	35
8	14	75	15	50	16	35
9	15	75	16	50	17	40
10	15	80	16	60	17	40
11	16	80	17	60	18	40
12	16	100	17	75	18	50
13	16	100	17	75	18	50
14	17	100	18	75	19	50

FIRE TOOLS FURNISHED  
Ash shovel, flue brush with handle, hoe and poker.

## ASBESTOS PLASTER

Plaster is furnished that the joints between the sections can be made  
and the boiler fired before covering the boiler complete. A sufficient  
amount of plaster is furnished for this purpose only.

## TRIMMINGS FURNISHED WITH STEAM BOILERS

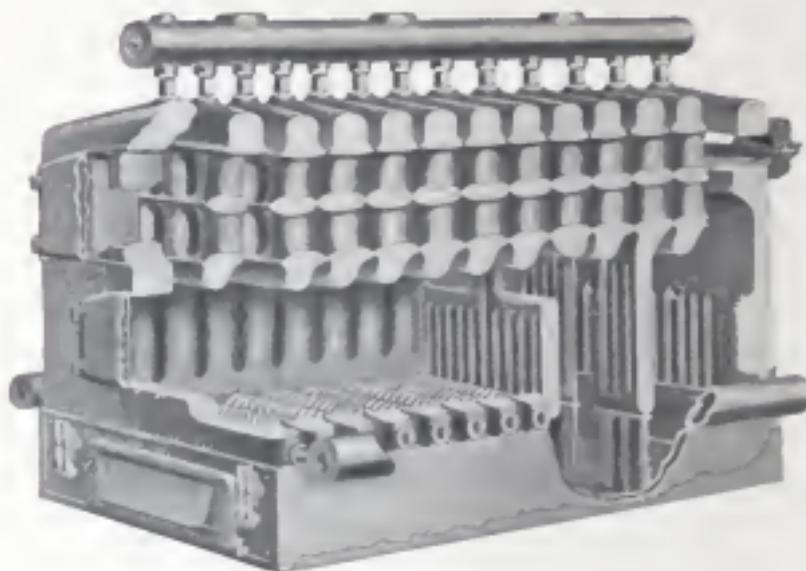
Water column, gauge cocks, water-gauge cocks, water-gauge glass,  
steam gauge (with cock), steam gauge siphon. Damper regulator  
complete with chain. Pipe and fittings for connecting steam trim-  
mings.

\* TAPPINGS other than those listed are SPECIAL. Order must  
SPECIFY SIZES.

No. 27 Smith Boilers

**No. 27 Smith Boiler**  
 with  
**Smokeless Furnace for Bituminous Coal**

Patent Applied For



20

Nos. 27 and 36 Smith Boiler with Smokeless Furnace

**COMMERCIAL RATINGS  
 FOR BITUMINOUS COAL**

Number of Sections in Boiler	Nominal Size of Fire Pot *	Fire (Heating) Surface	Steam Rating†	Water Rating†
	inches	Sq. ft.	feet	feet
10	27 x 30	152	1500	2475
11	27 x 30	166	1650	2725
11	27 x 36	166	1800	2975
12	27 x 36	180	1950	3225
12	27 x 42	180	2100	3475
13	27 x 42	194	2250	3725
13	27 x 48	194	2400	3950
14	27 x 48	208	2550	4200
15	27 x 54	222	2725	4500
16	27 x 60	236	2900	4775

Total height, 80 in.

Height of Water line, 57 in.

\* State which size of fire pot is desired.

Total width, Steam Boiler, 56 in.

Total width, Water Boiler, 59 in.

† FOR COMPUTING SIZE OF BOILER SEE PAGE 4.

**NO. 27 SMITH BOILER  
WITH  
SMOKELESS FURNACE FOR BITUMINOUS COAL**

Maximum Allowable Working Pressure—Steam 15 lb., Water 30 lb.  
Tested at 60 lb. per sq. in. Hydrostatic Pressure. A.S.M.E. Standard

**DIMENSIONS**

Number of Sections in Boiler	Nominal Size of Fire Pot* inches	Total Length of Boiler inches	Length at Foundation inches	Length of Fire Pot inches	Size of Smoke Pipe Opening inches
10	27 x 30	77	62	30	
11	27 x 30	83	68	30	
11†	27 x 36†	83	68	36	12 x 15
12	27 x 36	89	74	36	oval
12†	27 x 42†	89	74	42	equals
13	27 x 42	95	80	42	13 $\frac{1}{4}$
13†	27 x 48†	95	80	48	round
14	27 x 48	101	86	48	
15	27 x 54	107	92	54	
16	27 x 60	113	98	60	

Width at foundation... 35 in.  
Width of boiler, steam 56 in.  
Width of boiler water 59 in  
Height of boiler... 80 in  
Height of water line 57 in.  
Height of ash pit... 16 in  
Length of grate bar... 27 in

Dist. betw center of Grates... 6 in.  
Outside diam. of supply drum... 8 in.  
Outside diam. of return drum stn 4 $\frac{1}{2}$  in.  
Outside diam. of return drum wtr 6 in.  
Size of supply drum nipples 2 in x 6 in.  
Size of return drum nipples 1 $\frac{1}{4}$  in x 6 in.  
Distance from floor to center of  
smoke pipe opening... 55 in.

**SAFETY AND WATER RELIEF VALVE SIZES**

A S M E Standard

Number of Sections in Boiler	Size of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15	0-25	25-30
10	27 x 30	5.63	2	2	2
11	27 x 30	5.63	2	2	2
11†	27 x 36†	6.75	2	2	2
12	27 x 36	6.75	2	2	2
12†	27 x 42†	7.88	2	2	2
13	27 x 42	7.88	2	2	2
13†	27 x 48†	9.00	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
14	27 x 48	9.00	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
15	27 x 54	10.13	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
16	27 x 60	11.25	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$

\* State which size of Fire Pot is desired.

† Size of grate shipped unless otherwise specified.

No. 27 Smith Boilers

NO. 27 SMITH BOILER  
WITH  
SMOKELESS FURNACE FOR BITUMINOUS COAL  
REGULAR TAPPINGS \*

SUPPLY DRUM

Outside diameter..... 8 in.  
Each end tapped..... 2½ in.  
Tapped for 2 in. Lock-Nut Nipples.

NUMBER OF TAPPINGS ON

TOP OF DRUM

RETURN DRUMS

STEAM BOILERS:  
Outside diameter..... 4½ in.  
Tapped for 1½ in. Lock-  
Nut Nipples  
Top and bottom at oppo-  
site ends tapped..... 2 in.  
Side tapped..... 1½ in.  
Front ends tapped..... 2½ in.  
Rear ends tapped  
10 section..... 2½ in.  
11-16 sections..... 3 in.

WATER BOILERS:  
Outside diameter..... 6 in.  
Tapped for 1½ in. Lock-  
Nut Nipples  
Tapped underside..... 2 in.  
Side tapped..... 1½ in.  
Front ends tapped..... 2½ in.  
Rear ends tapped  
10-12 sections..... 5 in.  
13-16 sections, one 2½ in.,  
one 5 in.  
Top tapped  
10-12 sections..... 2 in.  
13-16 sections, one 2 in.,  
one 4 in.

22

Number of Boiler Sections		Size of Tappings in Inches			
Ste'm	Wat'r	2½	3	4	5
10	10	1	1	1	1
10	11	1	1	1	1
11	12	1	1	1	1
12	13	.	1	2	1
13	14	.	1	2	1
14	15	.	1	2	1
15	16	.	1	2	1
	16	.	1	2	1

RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	Diameter inches	Height feet	Diam- eter inches	Height feet	Diam- eter inches	Height feet
10	12	80	13	60	14	40
11	13	80	14	60	15	40
11	13	80	14	60	15	40
12	13	100	14	75	15	50
12	14	100	14	75	15	50
13	14	100	15	75	16	50
13	14	100	15	80	16	60
14	14	100	15	80	16	60
15	14	110	15	90	16	75
16	15	110	15	90	16	75

FIRE TOOLS FURNISHED

Ash shovel, flue brush with handle, hoe, rake and slice bar.

TRIMMINGS FURNISHED WITH STEAM BOILERS

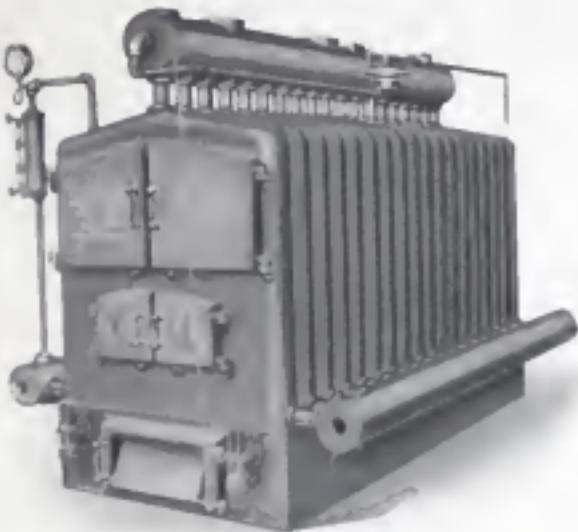
Water column, gauge cocks, water-gauge cocks, water-gauge glass, steam gauge (with cock), steam-gauge siphon. Damper regulator complete with chain. Pipe and fittings for connecting steam trimmings.

ASBESTOS PLASTER

Plaster is furnished that the joints between the sections can be made and the boiler fired before covering the boiler complete. A sufficient amount of plaster is furnished for this purpose only.

\* TAPPINGS other than those listed are SPECIAL. Order must SPECIFY SIZES.

**No. 36 Smith Boiler**  
**without**  
**Smokeless Furnace**



23

**Nos. 27 and 36 Smith Boiler without Smokeless Furnace**  
**COMMERCIAL RATINGS FOR BOILERS**  
**WITHOUT SMOKELESS FURNACE**

Number of Sections in Boiler	Nominal Size of Fire Pot inches	Fire (Heating) Surface Sq. ft.	Steam Rating* feet	Water Rating* feet
7	36 x 36	133.5	2300	3800
8	36 x 42	153.	2800	4625
9	36 x 48	172.5	3300	5450
10	36 x 54	192.	3800	6275
11	36 x 60	211.5	4300	7100
12	36 x 60	241.	4800	7925
12	36 x 66†	231.	4800	7925
13	36 x 66	260.5	5300	8750
13	36 x 72†	250.5	5300	8750
14	36 x 66	280.	5800	9575
14	36 x 78†	270.	5800	9575
15	36 x 72	290.5	6300	10400
15	36 x 84†	289.5	6300	10400
16	36 x 72	319.	6800	11225
16	36 x 90†	309.	6800	11225

Total height, 83 in.

Height of Water Line, 59 in.

† Maximum size of fire pot; not shipped as regular.

\* FOR COMPUTING SIZE OF BOILER SEE PAGE 4

Total width, Steam Boiler, 72 in.

Total width, Water Boiler, 76 in.

No. 36 Smith Boilers

NO. 36 SMITH BOILER  
WITHOUT  
SMOKELESS FURNACE

Maximum Allowable Working Pressure—Steam 15 lb., Water 30 lb.  
A.S.M.E. Standard

Tested at 60 lb. per sq. in. Hydrostatic Pressure

Number of Sections in Boiler	Size of Fire Pot inches	Total Length of Boiler inches	Length of Fire Pot inches	Length at Founda- tion inches	Size of Smoke Pipe Opening inches
7	36 x 36	63	36	44	
8	36 x 42	69	42	50	
9	36 x 48	75	48	56	
10	36 x 54	81	54	62	
11	36 x 60	87	60	68	12 x 20
12	36 x 60	93	60	74	oval
12	36 x 66*	93	66*	74	equals
13	36 x 66	99	66	80	17
13	36 x 72†	99	72*	80	round
14	36 x 66	105	66	86	
14	36 x 78*	105	78*	86	
15	36 x 72	111	72	92	
15	36 x 84†	111	84*	92	
16	36 x 72	117	72	98	
16	36 x 90†	117	90*	98	

Width at foundation	48 <sup>1</sup> / <sub>4</sub> in.	Dist. betw. center of Grates	6	in.
Width of boiler, steam	72 in.	Outside diam. of supply drum	10	in.
Width of boiler, water	76 in.	Outside diam. of return drums, steam	6	in.
Height of boiler	83 in.	Outside diam. of return drums, water	8	in.
Height of water line	.59 in.	Size of supply drum nipples	2 <sup>1</sup> / <sub>2</sub> x 6	in.
Height of ash pit	.16 in.	Size of return drum nipples	2 x 6	in.
Length of grate bars	35 <sup>5</sup> / <sub>8</sub> in.	Distance from floor to center of smoke pipe opening	.57	in.

SAFETY VALVE AND WATER RELIEF VALVE SIZES  
A S M E Standard

Number of Sections in Boiler	Size of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15	0-25	25-30
				Size Steam Safety Valve, in.	Water Relief Valves inches
7	36 x 36	9.00	2 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub>	2
8	36 x 42	10.50	2 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub>
9	36 x 48	12.00	2 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub>
10	36 x 54	13.50	3	3	2 <sup>1</sup> / <sub>2</sub>
11	36 x 60	15.00	3	3	2 <sup>1</sup> / <sub>2</sub>
12†	36 x 60†	15.00	3	3	2 <sup>1</sup> / <sub>2</sub>
12	36 x 66	16.50	3	3	3
13†	36 x 66†	16.50	3	3	3
13	36 x 72	18.00	3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	3
14†	36 x 66†	16.50	3	3	3
14	36 x 72	18.00	3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	3
14	36 x 78	19.50	3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	3
15†	36 x 72†	18.00	3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	3
15	36 x 78	19.50	3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	3
15	36 x 84	21.00	3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	3
16†	36 x 72†	18.00	3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	3
16	36 x 78	19.50	3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	3
16	36 x 84	21.00	3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	3
16	36 x 90	22.50	3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>

\* Maximum size of Fire Pot; not shipped as regular

† Size of grate shipped unless otherwise specified.

NO. 36 SMITH BOILER  
WITHOUT  
SMOKELESS FURNACE  
REGULAR TAPPINGS \*

## SUPPLY DRUM

Outside diameter..... 10 in  
Tapped for 2½ in. lock-nut nipples  
Each end tapped..... 2½ in.

## TAPPINGS ON TOP

Number of Sections	Size of Tappings, in	2½	3	3½	4	5	6
Ste'm Wat'r	Number of Tappings	7	1		3		
7		8	1		3		
8		9	1		3		
9		10	1		2	1	
10		11		1	2	1	
11		12		1	2		1
12		13		1		2	1
13		14		1	2	1	
14		15		1		3	
15		16		1		3	
16				1		3	

## RETURN DRUMS

STEAM BOILERS:  
Outside diameter..... 6 in.  
Tapped for 2 in. Lock-Nut Nipples

Top and bottom at opposite ends tapped..... 2 in.  
Front ends tapped..... 2½ in.  
Side tapped..... 1½ in.

Rear ends tapped:  
7 and 8 sections..... 2½ in.  
9 to 16 sections..... 3 in.

WATER BOILERS:  
Outside diameter..... 8 in  
Tapped for 2 in. Lock-Nut Nipples

Side tapped..... 1½ in.  
7 to 11 sections:

Front ends tapped, one 2½ in., one 5 in.

Rear ends tapped, one 2½ in., one 5 in.

Top tapped..... one 5 in.  
12 to 16 sections:

Front ends tapped, one 2½ in., one 6 in.

Rear ends tapped, one 2½ in., one 6 in.

Top tapped..... one 6 in.

## RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys are required.					
	Drum inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
7	17	80	17	60	17	40
8	17	80	17	60	18	40
9	17	80	17	60	18	45
10	17	100	18	75	19	50
11	18	100	18	75	20	55
12	19	100	19	75	20	60
13	19	110	19	90	20	65
14	20	110	20	90	21	70
15	20	110	21	90	21	75
16	21	110	21	90	22	80

## FIRE TOOLS FURNISHED

Ash shovel, flue brush with handle, hoe and poker.

## TRIMMINGS FURNISHED WITH STEAM BOILERS

Water column, gauge cocks, water-gauge cocks, water-gauge glass, steam gauge (with cock), steam-gauge siphon. Damper regulator complete with chain. Pipe and fittings for connecting steam trimmings.

## ASBESTOS PLASTER

Plaster is furnished that the joints between the sections can be made and the boiler fired before covering the boiler complete. A sufficient amount of plaster is furnished for this purpose only.

\* TAPPINGS other than those listed are SPECIAL. Order must SPECIFY SIZES.

**No. 36 Smith Boiler**  
 with  
**Smokeless Furnace for Bituminous Coal**  
 Patent Applied For



26

Rear View

No. 36 Smith Boiler with Smokeless Furnace  
 COMMERCIAL RATINGS  
 FOR BITUMINOUS COAL

Number of Sections in Boiler	Fire Box Capacity	Fir e Heating Surface sq. ft.	Steam Rating <sup>1</sup> foot	Water Rating <sup>1</sup> foot
11	30 x 30	294	2150	4000
12	30 x 30	300	2300	4500
13	30 x 42	306	3050	5210
14	30 x 42	312	3500	5770
15	30 x 45	318	3750	6200
16	30 x 45	324	4000	6600
17	30 x 52	330	4300	7000
18	30 x 52	336	4500	7450
19	30 x 52	342	4800	7900
20	30 x 56	348	5100	8425
21	30 x 56	354	5400	8800

Total Height, 8 ft. 6 in.

Design on Water Box, 30 x 30

\* Boiler should not be put in direct

Total Width, Boiler, 72 in.

Total Width, Water Box, 70 in.

NO. 36 SMITH BOILER

## WITH

## SMOKELESS FURNACE FOR BITUMINOUS COAL

Maximum Allowable Working Pressure—Steam 15 lb., Water 30 lb.  
Tested at 60 lb. per sq. in. Hydrostatic Pressure, A.S.M.E. Standard  
**DIMENSIONS**

Number of Sections in Boiler	Size of Fire Pot*	Total Length of Boiler inches	Length of Fire Pot*	Length at Founda- tion inches	Size of Smoke Pipe Opening inches
11	36 x 36	87	36	68	
12	36 x 36	93	36	74	
12	36 x 42	93	42	74	
13	36 x 42	99	42	80	12 x 20
13	36 x 48	99	48	80	oval
14	36 x 48	105	48	86	equals
14	36 x 54	105	54	86	17
15	36 x 54	111	54	92	round
16	36 x 60	117	60	98	
17	36 x 66	123	72	104	
18	36 x 72	129	78	110	

Width at foundation 48 $\frac{1}{4}$ in.	Dist. betw. center of Grates . . .	6 in.
Width of boiler, steam 72 in.	Outside diam. of supply drum . . .	10 in.
Width of boiler, water 76 in.	Outside diam. return drums, steam 6 in.	
Height of boiler . . . . . 83 in.	Outside diam. return drums, water 8 in.	
Height of water line 59 in.	Size of supply drum nipples 2 $\frac{1}{2}$ x 6 in.	
Height of ash pit . . . 16 in.	Size of return drum nipples 2 x 6 in.	
Length of grate bar. 35 $\frac{1}{2}$ in.	Distance from floor to center of	

*above pipe opening*

**SAFETY VALVE AND WATER RELIEF VALVE SIZES**

**A S M E Standard**

Number of Sections in Boiler	Size of Grate	Area of Grate	Working Pressure in lb. per sq. in.		
			0-15	0-25	25-30
11	36 x 36	9.00	2½	2½	2
12	36 x 36	9.00	2½	2½	2
12†	36 x 42†	10.50	2½	2½	2½
13	36 x 42	10.50	2½	2½	2½
13†	36 x 48†	12.00	2½	2½	2½
14	36 x 48	12.00	2½	2½	2½
14†	36 x 54†	13.50	3	3	2½
15	36 x 54	13.50	3	3	2½
16	36 x 60	15.00	3	3	2½
17	36 x 66	16.50	3	3	3
18	36 x 72	18.00	3½	3½	3

#### RECOMMENDED CHIMNEY SIZES

Number of Sec. in Boiler	Diam. inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
11	17	100	17	75	17	50
12	17	100	17	75	17	50
12	17	100	17	75	18	55
13	17	100	18	80	18	60
13	18	100	18	80	18	65
14	18	110	18	90	18	70
14	18	110	18	90	18	75
15	18	110	19	90	19	75
16	19	110	19	90	20	75
17	19	110	20	90	20	75
18	19	110	20	90	21	75

\* State size of Fire Pot desired.

† Size of grate shipped unless otherwise specified.

## No. 36 Smith Boilers

### NO. 36 SMITH BOILER WITH SMOKELESS FURNACE FOR BITUMINOUS COAL REGULAR TAPPINGS\* SUPPLY DRUM

Outside diameter ..... 10 in.  
Tapped for 2½ in. Lock-Nut Nipples  
Each end tapped. ..... 2½ in.

#### TAPPINGS ON TOP OF DRUM

Steam	Water	Size of Tappings, inches				
		3	3½	4	5	6
		Number of Tappings				
	11	1		2	1	
11	12	1		2		1
12	13	1			2	1
13	14		1		2	1
	14	15		1		3
15	16		1			3
16	17		1			3
17	18		1			3
18			1			3

28

#### RETURN DRUMS

STEAM BOILERS:  
Outside diameter ..... 6 in.  
Tapped for 2 inch Lock-Nut Nipples  
Top and bottom at opposite ends tapped. ..... 2 in.  
Front ends tapped. ..... 2½ in.  
Side tapped. ..... 1½ in.  
Rear ends tapped. ..... 3 in.

WATER BOILERS:  
Outside diameter ..... 8 in.  
Tapped for 2 inch Lock-Nut Nipples  
Side Tapped. ..... 1¼ in.  
11 Section:  
Front ends tapped. ..... one 2½ in. one 5 in.  
Rear ends tapped. ..... one 2½ in. one 5 in.  
Top tapped. ..... one 5 in.  
12-18 sections:  
Front ends tapped. ..... one 2½ in. one 6 in.  
Rear ends tapped. ..... one 2½ in. one 6 in.  
Top tapped. ..... one 6 in.

#### TRIMMINGS FURNISHED WITH STEAM BOILERS

Water column, gauge cocks, water-gauge cocks, water-gauge glass, steam gauge (with cock), steam-gauge siphon. Damper regulator complete with chain. Pipe and fittings for connecting steam trimmings.

#### FIRE TOOLS FURNISHED

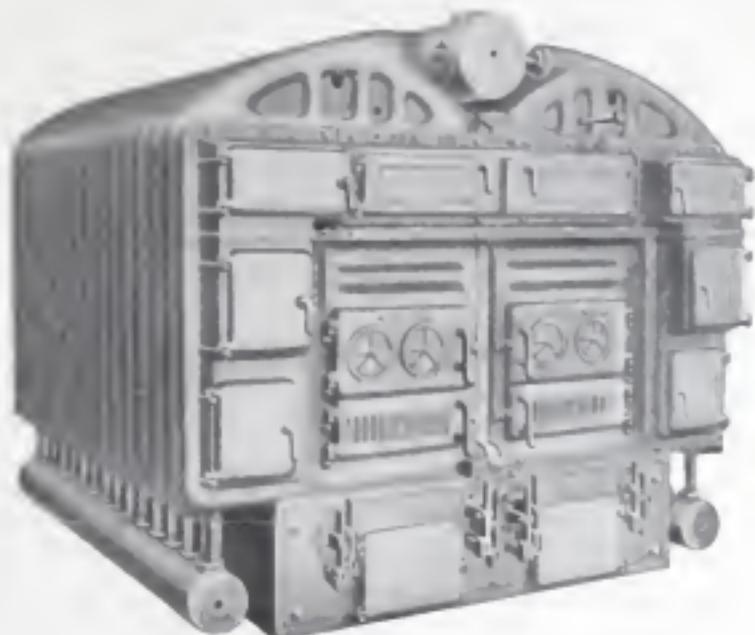
Ash shovel, flue brush with handle, hoe, rake and slice bar.

#### ASBESTOS PLASTER

Plaster is furnished that the joints between the sections can be made and the boiler fired before covering the boiler complete. A sufficient amount of plaster is furnished for this purpose only.

\* TAPPINGS other than those listed are SPECIAL. Order must SPECIFY SIZES.

**No. 60 Smith Boiler**  
**without**  
**Smokeless Furnace**



29

**COMMERCIAL RATINGS FOR BOILERS  
 WITHOUT SMOKELESS FURNACE**

Number of Sections in Boiler	Size of Fire Pot	Fire Heating Surface	Steam Rating*	Water Rating*
	inches	Sq. ft	feet	feet
8	60 x 36	314	6300	9930
9	60 x 42	352	7230	11900
10	60 x 48	390	8400	13850
11	60 x 54	424	9630	15850
12	60 x 60	462	10830	17830
13	60 x 66	500	12900	19800
14	60 x 72	538	13290	21830
15	60 x 78	576	14400	22750
16	60 x 84	610	15600	23750
17	60 x 78	673	16830	27700
17	60 x 90†	618	16830	27700
18	60 x 84	711	18300	29700
18	60 x 96†	686	18300	29700

Total Height, 87 in.

Total Width, 98 in.

Height of Water Line, 66 in.

† Maximum size of fire pot, not shipped as regular

\*FOR COMPUTING SIZE OF BOILER SEE PAGE 4.

NO. 60 SMITH BOILER  
WITHOUT  
SMOKELESS FURNACEMaximum Allowable Working Pressure—Steam 15 lb., Water 30 lb.  
A.S.M.E. Standard  
Tested at 60 lb. per sq. in. Hydrostatic Pressure

## DIMENSIONS

Number of Sections in Boiler	Size of Fire Pot inches	Total Length of Boiler inches	Length of Fire Pot inches	Length at Founda- tion inches	Size of Smoke Pipe Opening inches
8	60 x 36	86	36	49	
9	60 x 42	92	42	55	
10	60 x 48	98	48	61	
11	60 x 54	104	54	67	16 x 37
12	60 x 60	110	60	73	oval
13	60 x 66	116	66	79	equals in area 26
14	60 x 72	122	72	85	round.
15	60 x 78	128	78	91	in circum- ference
16	60 x 84	134	84	97	29½
17	60 x 78	140	78	103	round
17	60 x 90*	140	90*	103	
18	60 x 84	146	84	109	
18	60 x 90*	146	96*	109	

30	Width at foundation	.72 in.	Dist. betw. center of Grates	.....	6 in.
	Width of boiler	98 in.	Diameter of supply drum	.....	12 in.
	Height of boiler	87 in.	Diameter of return drums	.....	8 in.
	Height of water line	66 in.	Size of supply drum nipples	2 x 4½ in.	
	Height of ash pit	18 in.	Size of return drum nipples	2 x 9 in.	
	Length of grate bars (double)	60 in.	Distance from floor to smoke pipe opening	.....	41 in.

SAFETY VALVE AND WATER RELIEF VALVE SIZES  
A.S.M.E. Standard

Number of Sections in Boiler	Size of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15	0-25	25-30
			Size Steam Safety Valve, in.	Size Water Relief Valves inches	
8	60 x 36	15.00	3	3	2½
9	60 x 42	17.50	3	3	3
10	60 x 48	20.00	3½	3½	3
11	60 x 54	22.50	3½	3½	3½
12	60 x 60	25.00	4	4	3½
13	60 x 66	27.50	4	4	3½
14	60 x 60	25.00	4	4	3½
14†	60 x 72†	30.00	4	4	4
15	60 x 60	25.00	4	4	3½
15	60 x 66	27.50	4	4	3½
15†	60 x 78†	32.50	4½†	4½†	4
16	60 x 66	27.50	4	4	3½
16	60 x 72	30.00	4	4	4
16†	60 x 84†	35.00	4½†	4½†	4
17	60 x 72	30.00	4	4	4
17†	60 x 78†	32.50	4½†	4½†	4
17	60 x 90	37.50	4½†	4½†	4
18	60 x 78	32.50	4½	4½	4
18†	60 x 84†	35.00	4½†	4½†	4

† Size of Grate shipped unless otherwise specified.

‡ Y Connection to take one 3-in. and one 3½-in. valve.

\* Maximum size of Fire Pot; not shipped as regular.

NO. 60 SMITH BOILER  
WITHOUT  
SMOKELESS FURNACE  
REGULAR TAPPINGS\*  
SUPPLY DRUM

Outside diameter..... 12 in.

Tapped for 2 inch Lock-Nut Nipples. Front end tapped 2 inches.

Rear end tapped one 4 inches, and one 2 inches.

#### TAPPINGS ON TOP OF SUPPLY DRUM

Number of Sections	Size of Tappings, inches				Number of Tappings
	4	5	6	8	
5	12	12	12	12	4
9	-	-	-	-	9
10	-	-	-	-	10
11	-	-	-	-	11
12	-	-	-	-	12
13	-	-	-	-	13
14	-	-	-	-	14
15	-	-	-	-	15
16	-	-	-	-	16
17	-	-	-	-	17
18	-	-	-	-	18

#### RETURN DRUMS

8 in. 31

Outside diameter. . . . . .

Tapped for 2 inch Lock-Nut Nipples

Front ends tapped  
Back ends tapped

Rear ends tapped.  
Undersides scraped.

### Undersides tapped

#### FIRE TOOLS FURNISHED

Poker, hoe, flue brush with handle, and ash shovel.

## TRIMMINGS FURNISHED WITH STEAM BOILERS

Water column, gauge cocks, water-gauge cocks, water-gauge glass, steam-gauge (with cock), steam-gauge siphon. Damper regulator complete with chain. Pipe and fittings for connecting steam trimmings.

#### ASBESTOS PLASTER

**ASBESTOS PLASTER**

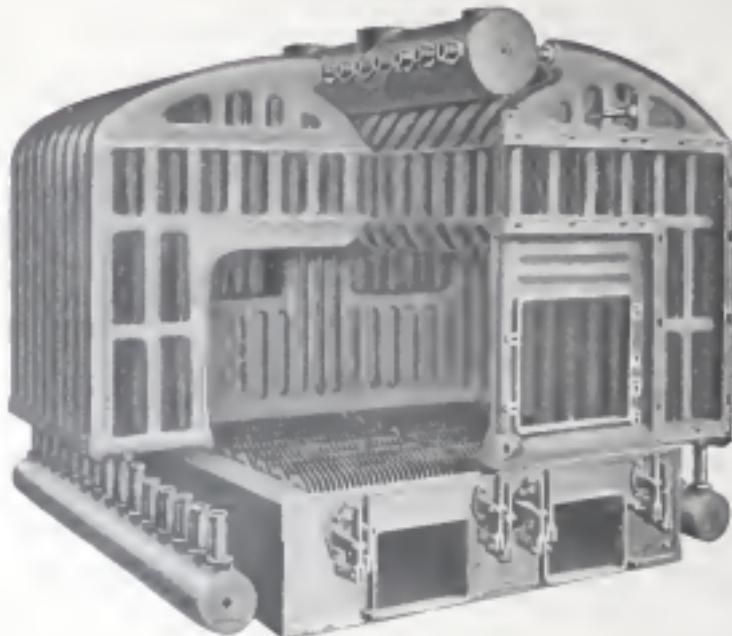
Plaster is furnished in order that the joints between the sections can be made and the boiler fired before covering the boiler complete. A sufficient amount of plaster is furnished for this purpose only.

#### RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys may be necessary.					
	Diam. inches	Height feet	Diam. inches	Height feet	Diam. Inches	Height feet
8	19	100	20	70	22	40
9	20	100	21	70	24	40
10	21	100	22	75	24	50
11	22	100	23	75	26	50
12	23	100	25	75	27	50
13	24	100	26	75	28	50
14	25	100	27	75	29	50
15	26	100	28	75	30	50
16	27	100	29	75	31	50
17	28	100	29	80	31	60
18	29	100	30	80	32	60

\* TAPPINGS other than those listed are SPECIAL. Order must  
SPECIFY SIZES.

**No. 60 Smith Boiler**  
**with**  
**Smokeless Furnace for Bituminous Coal**  
**Patent Applied For**



32

Interior—No. 60 Smith with Smokeless Furnace  
 COMMERCIAL RATINGS FOR BITUMINOUS COAL

Number of Sections in Boiler	Size of Fire Pot*	Fire (Heating) Surface	Steam Rating†	Water Rating†
	inches	Sq. ft.	feet	feet
12	60 x 36	515	6600	10900
13	60 x 36	553	7200	11900
13	60 x 42	553	7800	12850
14	60 x 42	591	8400	13850
14	60 x 48	591	9600	14850
15	60 x 48	629	9600	15850
15	60 x 54	629	10200	16850
16	60 x 54	667	10800	17800
17	60 x 60	701	12000	19800
18	60 x 66	739	13200	21800
19	60 x 72	777	14400	23750
20	60 x 78	815	15600	25750

Total Height, 87 in.

Total Width, 98 in.

Height of Water Line, 66 in.

\* State which size of fire pot is desired.

† FOR COMPUTING SIZE OF BOILER SEE PAGE 4

## NO. 60 SMITH BOILER

WITH

## SMOKELESS FURNACE FOR BITUMINOUS COAL

Maximum Allowable Working Pressure—Steam 15 lb., Water 30 lb.

A.S.M.E. Standard

Tested at 60 lb. per sq. in. Hydrostatic Pressure

Number of Sections in Boiler	Size of Fire Pot* inches	Total Length of Boiler inches	Length of Fire Pot* inches	Length at Foundation inches	Size of Smoke Pipe Opening inches
12	60 x 36	110	36	73	
13	60 x 36	116	36	79	
13	60 x 42	116	42	79	
14	60 x 42	122	42	85	16 x 37 oval
14	60 x 48	122	48	85	equals
15	60 x 48	128	48	91	in area
16	60 x 54	128	54	91	26 round, in circumference
16	60 x 54	134	54	97	29½ round
17	60 x 60	140	60	103	
18	60 x 66	146	66	109	
19	60 x 72	152	72	115	
20	60 x 78	158	78	121	

Width at foundation . . . . 72 in. Dist. betw. center of Grates . . . . 6 in.  
 Width of boiler . . . . 98 in. Diameter of supply drum . . . . 12 in.  
 Height of boiler . . . . 87 in. Diameter of return drums . . . . 8 in.  
 Height of water line . . . . 66 in. Size of supply drum nipples 2 x 4½ in.  
 Height of ash pit . . . . 18 in. Size of return drum nipples 2 x 9 in.  
 Length of grate bars (double) . . . . 60 in. Distance from floor to smoke pipe opening . . . . 41 in.

33

## SAFETY VALVE AND WATER RELIEF VALVE SIZES

A.S.M.E. Standard

Number of Sections in Boiler	Size of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15	0-25	25-30
			Size Steam Safety Valve in.	Size Water Relief Valves	inches
12	60 x 36	15.00	3	3	2½
13†	60 x 36†	15.00	3	3	2½
13	60 x 42	17.50	3	3	3
14†	60 x 42†	17.50	3	3	3
14	60 x 48	20.00	3½	3½	3
15†	60 x 48†	20.00	3½	3½	3
15	60 x 54	22.50	3½	3½	3½
16	60 x 54	22.50	3½	3½	3½
17	60 x 60	25.00	4	4	3½
18	60 x 66	27.50	4	4	3½
19	60 x 72	30.00	4	4	4
20	60 x 78	32.50	4½†	4½†	4

\* State which size of Fire Pot is desired.

† Size of grate shipped unless otherwise specified

‡ Y Connection to take one 3-in. and one 3½-in. valve.

No. 60 Smith Boilers

NO. 60 SMITH BOILER  
WITH  
SMOKELESS FURNACE FOR BITUMINOUS COAL  
REGULAR TAPPINGS \*  
SUPPLY DRUM

Outside diameter..... 12 in  
Tapped for 2 inch Lock-Nut Nipples. Front end tapped  
2 inches. Rear end tapped one 4 inches and one 2 inches.

TAPPINGS ON TOP OF SUPPLY DRUM

Number of Sections	Size of Tappings, in.		Number of Tappings
	5	8	
12	2	2	
13	2	2	
14	2	3	
15	2	3	
16	2	3	
17	2	3	
18	2	3	
19	2	3	
20	2	3	

RETURN DRUMS

34 Outside diameter..... 8 in.  
Tapped for 2 inch Lock-Nut Nipples  
Front ends tapped..... 2½ in.  
Rear ends tapped..... 5 in.  
Undersides tapped..... 1¼ in.

CHIMNEY SIZES RECOMMENDED

Number of Sections in Boiler	Diam. inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
12	20	100	21	75	23	50
13	20	100	22	75	23	50
13	21	100	22	75	24	50
14	21	100	23	75	25	50
14	22	100	23	75	25	50
15	22	100	24	75	26	50
15	23	100	24	80	26	60
16	23	100	24	80	26	60
17	24	100	25	80	27	60
18	25	100	26	80	27	60
19	25	100	26	90	27	75
20	26	100	27	90	28	75

FIRE TOOLS FURNISHED

Rake, hoe, slice bar, flue brush with handle, and ash shovel.

TRIMMINGS FURNISHED WITH STEAM BOILERS

Water column, gauge cocks, water-gauge cocks, water-gauge glass, steam gauge (with cock), steam-gauge siphon. Damper regulator complete with chain. Pipe and fittings for connecting steam trimmings.

ASBESTOS PLASTER

Plaster is furnished in order that the joints between the sections can be made and the boiler fired before covering the boiler complete. A sufficient amount of plaster is furnished for this purpose only.

\* TAPPINGS other than those listed are SPECIAL. Order must SPECIFY SIZES.

## H-B Boilers



35

No. 115 H-B Steam Boiler

No. 215 H-B Boiler is made by adding fire pot extension to the

No. 115 H-B Boiler

H-B BOILERS



36

Rear View

No. 317, 319, 321 and 323 H-B Water Boiler

Showing front and rear connections between Sections

All connections are exposed to view outside of Boiler

H-B BOILERS



37

Front View

No. 224 and 227 H-B Steam Boiler



38

No. 324 H-B Steam Boiler  
 Transverse Section—Arrows indicate Fire Travel  
 Showing Horizontal Fire Travel and Large Vertical Water Ways  
 COMMERCIAL RATINGS \*

Number of Boiler	Nominal Diameter of Fire Pot inches	Steam Rating* feet	Water Rating* feet
115	15	250	425
217	17	325	550
317	17	375	625
219	19	425	700
319	19	475	775
221	21	500	825
321	21	550	900
223	23	600	1000
323†	23	700†	1150†
224	24	650	1075
324	24	800	1325
227	27	900	1500
327	27	1000	1650

† Note No. 323 is larger than No. 224.

\* FOR COMPUTING SIZE OF BOILER SEE PAGE 4

## H-B BOILERS

Maximum Allowable Working Pressure—Steam 15 lb., Water 30 lb.

Tested at 60 lb. per sq. in. Hydrostatic Pressure A.S.M.E. Standard

## DIMENSIONS IN INCHES

Number of Boiler	115	217	317	219	319	221	321
Total Height of Boiler	46	55½	62½	55½	62½	56½	63½
Height of Ash Pit	12	12	12	12	12	12	12
Height of Fire Pot	...	22½	22½	22½	22½	22½	22½
Height of Intermediate Section	...	7	7	7	7	7	7
Height of Dome	34	20½	20½	20½	20½	22	22
Height of Water Line	39½	49½	56½	49½	56½	49½	56½
Distance from Floor to Smoke Pipe Opening	35	42	49	42	49	42	49
Diameter of Smoke Pipe Opening	6	7	7	7	7	8	8
Length at Floor	25	25	25	27½	27½	29½	29½
Width at Floor	24½	24½	24½	27½	27½	29½	29½
Outside Diameter of Fire Pot	19	20½	20½	22½	22½	24½	24½
Outside Diameter of Intermediate Section	...	...	17	...	17	...	21
Outside Diameter of Dome Section	19	17	17	17	17	21	21

39

## DIMENSIONS IN INCHES

Number of Boiler	223	323	224	324	227	327
Total Height of Boiler	56½	63½	58	65½	58	65½
Height of Ash Pit	12	12	14	14	14	14
Height of Fire Pot	22½	22½	22	22	22	22
Height of Intermediate Sec.	7	7	7	7½	7	7½
Height of Dome	22	22	22	22	22	22
Height of Water Line	49½	56½	51	58½	51	58½
Distance from Floor to Smoke Pipe Opening	42	49	44	51½	44	51½
Diameter of Smoke Pipe Opening	8	8	8	8	8	8
Length at Floor	32	32	35½	35½	38½	38½
Width at Floor	31½	31½	33½	33½	37	37
Outside Diameter of Fire Pot	26½	26½	28½	28½	31½	31½
Outside Diameter of Intermediate Section	...	21	...	24	...	24
Outside Diameter of Dome Section	21	21	24	24	24	24

## FIRE TOOLS FURNISHED

Poker and flue brush with handle.

## TRIMMINGS FURNISHED WITH STEAM BOILERS

Steam gauge with cock. Water column complete. Two  $\frac{3}{4}$  in. gauge cocks. One pair water-gauge cocks with glass. Damper regulator complete with chain. Pipe and fittings for connecting steam trimmings.

**H-B BOILERS**  
**SAFETY VALVE AND WATER RELIEF SIZES**  
**A.S.M.E. Standard**

Number of Boiler	Approx. Diameter of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15	0-25	25-30
			Size Steam Safety Valve, inches	Size Water Relief Valves, inches	
115	13.5	1.12	1	1	1
217	13.5	1.12	1	1	1
317	13.5	1.12	1	1	1
219	16.9	1.55	1	1	1
319	16.9	1.55	1	1	1
221	18.6	1.89	1	1	1
321	18.6	1.89	1	1	1
223	21.0	2.40	1½	1½	1
323	21.0	2.40	1½	1½	1
224	22.6	2.78	1¾	1¾	1¾
324	22.6	2.78	1¾	1¾	1¾
227	25.5	3.53	1½	1½	1¾
327	25.5	3.53	1½	1½	1¾

## REGULAR TAPPINGS \*

Number of Boiler	TAPPINGS ON TOP OF DOME						
	%	1	1½	1¾	2	2½	3
		Size of Tappings, inches		Number of Tappings			
115	1	2		2		1	
217	1	2		2			1
317	1	2		2			1
219	1	2		2			1
319	1	2		2			1
221	1	1	1	1	1		1
321	1	1	1	1	1		1
223	1	1	1	1	1		1
323	1	1	1	1	1		1
224	1	2		1			2
324	1	2		1			2
227	1	2		1			2
327	1	2		1			2

## RETURN TAPPINGS

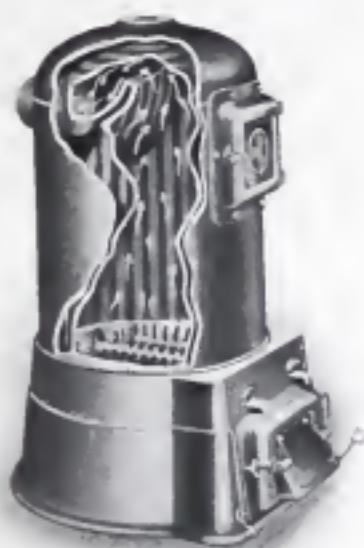
Nos 115 and 215: One 2½ in., Two 1½ in. Other Boilers: Two 3 in.

## RECOMMENDED CHIMNEY SIZES

Number of Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys may be necessary.					
	Diam. inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
115	8	60	8	40	8	25
217	9	75	9	50	9	30
317	9	75	9	50	9	30
219	9	75	9	50	9	35
319	9	75	9	50	10	35
221	9	75	10	50	10	35
321	10	75	10	50	10	35
223	10	75	10	50	11	35
323	10	75	10	50	11	35
224	10	75	10	50	11	35
324	10	75	11	50	11	35
227	10	75	11	50	12	35
327	10	75	11	50	12	35

\* TAPPINGS other than those listed are SPECIAL. Order must SPECIFY SIZES.

## Menlo Boilers



41

## Nos. 10, 12 and 14 Water Boilers

Interior Showing Fire Travel

No. 214 Menlo Boiler is made by adding fire pot extension

## COMMERCIAL RATINGS\*

Number of Boiler	Diameter of Fire Pot inches	Steam	Water	Hot Water Supply
		Rating* feet	Rating* feet	Rating gallons†
10	10	...	200	225
12	12	...	300	350
14	14	...	400	500
214	14	...	500	750
16	16	...	500	...
18	18	...	600	...
20	20	...	800	...

† Tank capacity for various sizes of Boiler for Hot Water Supply—  
average condition.NOTE.—Not capacity in gallons per hour to be raised from a low to a  
high temperature.

\* FOR COMPUTING SIZE OF BOILER SEE PAGE 4

**Menlo Boilers**

**MENLO BOILERS**  
**DIMENSIONS IN INCHES**

Number of Boiler	10	12	14	214	16	18	20
Total Height of Boiler	32	33½	39	45½	50	50	51
Height of Ash Pit	8	8	12	12	12	12	12
Height of Water Line	...	...	...	...	44	44	45
Height of Dome	24	25½	27	27	38	38	39
Outside Diameter of Dome	15	17½	20	20	22	24	26
Distance from Floor to Center of Smoke Pipe Opening	25	26	31½	37½	37½	37½	38
Diameter of Smoke Pipe Opening	5	5	6	6	7	7	8
Length at Floor	19½	22	25	25	27½	29½	32
Width at Floor	19½	22	24¾	24¾	27½	29½	31½

**MAXIMUM ALLOWABLE WORKING PRESSURE**  
**A S M E. Standard**

Number of Boiler	Tested Hydrostatic Pressure lb. per sq. in.	Maximum Allowable Working Pressure lb. per sq. in.	
		Water	Steam
10	200	80	..
12	175	70	..
14	150	60	..
214	150	60	..
16	75	30	..
18	75	30	..
20	75	30	..

FIRE TOOLS FURNISHED, Nos. 16, 18 and 20—Poker.

TRIMMINGS FURNISHED WITH STEAM BOILERS

Steam gauge with cock. One pair water-gauge cocks with glass. Water column complete. Damper regulator complete with chain. Two  $\frac{3}{8}$  in. gauge cocks. Pipe and fittings for connecting steam trimmings.

**SAFETY VALVE AND WATER RELIEF VALVE SIZES**  
**A S M E. Standard**

Number of Boiler	Approx. Diameter of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15	0-25	25-80
			Size Steam Safety Valve, inches	Size Water Relief Valves	inches
10	10.00	.55	...	1	1
12	12.00	.79	...	1	1*
14	13.50	1.12	...	1	1†
214	13.50	1.12	...	1	1†
16	16.90	1.55	1	1	1‡
18	18.60	1.89	1	1	1‡
20	21.00	2.40	1½	1½	1‡

\* Maximum allowable working pressure, water, 70 lb. per sq. in.

† Maximum allowable working pressure, water, 60 lb. per sq. in.

‡ Maximum allowable working pressure, water, 30 lb. per sq. in.

## MENLO BOILER



## Nos. 16, 18 and 20 Water Boilers

## REGULAR TAPPINGS

No.	Supply	Return
10	One 2 in.	Three 2 in.
12	One 2 in.	Three 2 in.
14	One 2½ in.	Three 2 in.
214	One 2½ in.	One 2½ in., four 1½ in.
16	One 3 in., two 1½ in., two 1 in.	One 3 in., two 2 in.
18	One 3 in., two 1½ in., two 1 in.	One 3 in., two 2 in.
20	One 3 in., two 1½ in., two 1 in.	One 3 in., two 2 in.

## RECOMMENDED CHIMNEY SIZES

Number of Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys may be necessary.					
	Diam. inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
10	8	60	8	40	8	25
12	8	60	8	40	8	25
14	8	60	8	40	8	25
214	8	75	8	50	8	40
16	8	75	8	50	8	30
18	9	75	9	50	9	30
20	9	75	9	50	10	35

**Smith Service Boilers W-17**

FOR HOT WATER SUPPLY



44

Front View  
Shipped Knocked Down  
COMMERCIAL RATINGS

Number of Sections	Nominal Size of Fire Pot, inches	Fire (Heating) Surface, sq. ft.	Rating, gallons †
4	18 x 12	24.0	900
5	18 x 16	29.5	1200
6	18 x 20	35.0	1500
7	18 x 24	40.5	1800
8	18 x 28	46.0	2100
9	18 x 32	51.5	2400
10	18 x 36	57.0	2700
11	18 x 40	62.5	3000

† Tank capacity for various sizes of Boiler for Hot Water Supply—Average Condition.

NOTE—Not capacity in gallons per hour to be raised from a low to a high temperature.

## SMITH SERVICE BOILERS W-17

Maximum Allowable Working Pressure, 160 lb.

A.S.M.E. Standard

Tested at 400 lb. per sq. in. Hydrostatic Pressure

Interior  
DIMENSIONS

Number of Sections	Nominal Size of Fire Pot inches	Total Length of Boiler inches	Length of Fire Pot inches	Length at Founda- tion inches	Diameter of Smoke Pipe Opening inches
4	18 x 12	30 $\frac{1}{2}$	12	18 $\frac{1}{2}$	8
5	18 x 16	34 $\frac{1}{2}$	16	22 $\frac{1}{2}$	8
6	18 x 20	38 $\frac{1}{2}$	20	26 $\frac{1}{2}$	8
7	18 x 24	42 $\frac{1}{2}$	24	30 $\frac{1}{2}$	8
8	18 x 28	46 $\frac{1}{2}$	28	34 $\frac{1}{2}$	8
9	18 x 32	50 $\frac{1}{2}$	32	38 $\frac{1}{2}$	8
10	18 x 36	54 $\frac{1}{2}$	36	42 $\frac{1}{2}$	8
11	18 x 40	58 $\frac{1}{2}$	40	46 $\frac{1}{2}$	8

Width at foundation 23 in. Length of grate bar..... 14 in.  
 Width of boiler .... 24 $\frac{1}{2}$  in. Dist. betw center of grates.... 4 in.  
 Height of boiler .... 50 $\frac{1}{2}$  in. Distance from floor to center of  
 Height of ash pit.... 12 in. smoke pipe opening..... 40 $\frac{1}{4}$  in.

## FIRE TOOLS FURNISHED

Poker, hoe, flue brush with handle, ash shovel.

Four brass washout plugs are furnished with boiler.

Water relief valve, altitude gauge and thermometer are NOT furnished.

SMITH SERVICE BOILERS W-17 are shipped knocked down.

**SMITH SERVICE BOILER W-17**  
**FOR HOT WATER SUPPLY**  
**REGULAR TAPPINGS**

Tappings	No	Size	Location
Supply.....	1	3 in.	Top
Water relief valve (see table of W. R. Valve sizes below).....	1	3 in.	Top
Return.....	1	3 in.	Rear
Draw off.....	2	3/4 in.	Sides of Front Section
Altitude gauge.....	1	3/4 in.	Top of Front Section
Thermometer.....	1	3/4 in.	Top of Front Section
Washout holes (at bottom).....	4	2 1/2 in.	Two in front, two in rear

**ASBESTOS PLASTER**

Plaster is furnished in order that the joints between the sections can be made and the boiler fired before covering the boiler complete. A sufficient amount of plaster is furnished for this purpose only.

**WATER RELIEF VALVE SIZES**

46

Number of Sections	Size of Grate inches	Area of Grate sq. ft.	Size of Water Relief Valve A.S.M.E. Standard			
			0-25	25-50	50-100	100-150
4	14 x 12	1.17				
5	14 x 16	1.56	1 in.	1 in.	1 in.	
6	14 x 20	1.94				
7	14 x 24	2.33				
8	14 x 28	2.72	1 1/4 in.			
9	14 x 32	3.11				
10	14 x 36	3.50		1 1/4 in.	1 1/4 in.	
11	14 x 40	3.89	1 1/2 in.			1 1/4 in. 1 1/4 in.

**CHIMNEY SIZES RECOMMENDED**

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys are required.					
	Diam. inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
4	8	75	9	50	9	25
5	9	75	9	50	10	25
6	9	75	10	50	11	25
7	10	75	10	50	11	25
8	10	75	11	50	12	25
9	11	75	11	50	13	25
10	11	75	12	50	13	25
11	11	75	12	50	14	25

## No. 18 Mercer Return Flue Boiler



No. 18 Steam Boiler  
COMMERCIAL RATINGS

Number of Sections	Size of Fire Pot inches	Fire (Heating) Surface sq. ft.	Steam Rating* feet	Water Rating* feet
4	18 x 18	37.	475	775
5	18 x 24	46.5	625	1025
6	18 x 30	56.	775	1275
7	18 x 36	65.5	925	1525
8	18 x 42	75.	1075	1775
9	18 x 48	84.5	1225	2025
10	18 x 48	97.	1375	2275
10	18 x 54†	94.	1375	2275
11	18 x 54	106.5	1525	2525
11	18 x 60†	103.5	1525	2525
12	18 x 54	116.	1675	2775
12	18 x 66†	113.	1675	2775

Total Height, 68½ in.

Total Width, 47 in.

Height of Water Line, 50½ in.

† Maximum size of Fire Pot, not shipped as regular.

\* FOR COMPUTING SIZE OF BOILER SEE PAGE 4

## No. 18 Mercer Boilers

## NO. 18 MERCER RETURN FLUE BOILER

Maximum Allowable Working Pressure—Steam 15 lb., Water 30 lb.

A.S.M.E. Standard

Tested at 60 lb. per sq. in. Hydrostatic Pressure

## DIMENSIONS

Number of Sections	Nominal Size of Fire Pot	Total Length of Boiler	Length of Fire Pot	Length at Foundation	Diameter of Smoke Pipe Opening
	inches	inches	inches	inches	inches
4	18 x 18	34	18	26	9
5	18 x 24	40	24	32	9
6	18 x 30	46	30	38	9
7	18 x 36	52	36	44	9
8	18 x 42	58	42	50	9
9	18 x 48	64	48	56	9
10	18 x 48	70	48	62	9
10	18 x 54*	70	54*	62	9
11	18 x 54	76	54	68	9
11	18 x 60*	76	60*	68	9
12	18 x 54	82	54	74	9
12	18 x 66*	82	66*	74	9

Width at foundation 27 in. Dist. betw. center of grates..... 6 in.  
 Width of boiler..... 47 in. Outside diameter of supply drum 6 in.  
 Height of boiler..... 68½ in. Outside diameter of return drums 4½ in.  
 Height of water line 50½ in. Size of supply drum nipples 1½ x 6 in.  
 Height of ash pit.... 12 in. Size of return drum nipples 1½ x 6 in.  
 Length of grate bar.. 18 in. Distance from floor to center of smoke pipe opening..... 47½ in.

48

SAFETY VALVE AND WATER RELIEF VALVE SIZES  
A.S.M.E. Standard

Number of Sections in Boiler	Size of Grate	Area of Grate	Working Pressure in lb. per sq. in.		
			0-15	0-25	25-30
	inches	sq. ft.	Size Steam Safety Valve, inches	Size Water Relief Valves, inches	
4	18 x 18	2.25	1½	1½	1½
5	18 x 24	3.00	1½	1½	1½
6	18 x 30	3.75	1½	1½	1½
7	18 x 36	4.50	1½	1½	1½
8	18 x 42	5.25	2	2	1½
9	18 x 48	6.00	2	2	2
10†	18 x 48†	6.00	2	2	2
10	18 x 54	6.75	2	2	2
11†	18 x 54†	6.75	2	2	2
11	18 x 60	7.50	2	2	2
12†	18 x 54†	6.75	2	2	2
12	18 x 60	7.50	2	2	2
12	18 x 66	8.25	2½	2½	2

\* Maximum size of Fire Pot, not shipped as regular.

† Size of grate shipped unless otherwise specified.

## NO. 18 MERCER RETURN FLUE BOILER

## REGULAR TAPPINGS \*

TAPPINGS ON TOP  
OF SUPPLY DRUM

Number of Sections	Size of Tappings, in.				
	Ste'm	Wat'r	1 1/4	1 1/2	2
4	4	1	2	1	1
5	5	1	2	1	1
6	6	1	2	1	1
7	7	1	2	1	1
8	8	1	2	1	1
9	9	1	1	1	1
10	10	1	1	1	1
11	11	1	1	1	1
12	12	1	2	1	1
			2	1	1

## STEAM DRUM

Outside diameter..... 6 in.  
Tapped for 1 1/2 in. Lock-Nut  
Nipples  
Ends tapped..... 2 1/2 in.

## RETURN DRUMS

Outside diameter..... 4 1/2 in.  
Tapped for 1 1/2 in. Lock-Nut  
Nipples  
Top and bottom at opposite  
ends tapped..... 2 in.  
Side tapped..... 1 1/4 in.  
Front ends tapped..... 2 1/2 in.  
Rear ends tapped  
4-10 sections..... 2 1/2 in.  
11 and 12 sections..... 3 in.

## FIRE TOOLS FURNISHED

Flue brush (with handle), hoe, poker, and ash shovel.

49

## TRIMMINGS FURNISHED WITH STEAM BOILERS

Water column, gauge cock, water-gauge cock, water-gauge glass, steam gauge (with cock), steam-gauge siphon. Damper regulator complete with chain.

## ASBESTOS PLASTER

Plaster is furnished in order that the joints between the sections can be made and the boiler fired before covering the boiler complete. A sufficient amount of plaster is furnished for this purpose only.

## RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the taller chimneys may be necessary.					
	Diam. inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
4	9	75	9	50	10	35
5	9	75	10	50	11	35
6	10	75	11	50	11	35
7	11	75	11	50	12	35
8	11	75	12	50	13	35
9	12	75	12	60	13	40
10	12	75	13	60	14	40
11	13	75	13	60	14	40
12	13	75	14	60	15	40

\* Tappings other than those listed are special, order must specify sizes.

## No. 27 Mercer Return Flue Boiler



50

## No. 27 Water Boiler

## COMMERCIAL RATINGS

Number of Sections	Size of Fire Pot	Fire (Heating) Surface	Steam		Water Rating*
			Rating*	feet	
6	27 x 30	71.5	1400	2300	
7	27 x 36	82.5	1700	2800	
8	27 x 42	94.	2000	3300	
9	27 x 48	105.5	2300	3800	
10	27 x 54	117.	2600	4300	
11	27 x 54	134.	2900	4775	
11	27 x 60†	128.5	2900	4775	
12	28 x 54	145.	3200	5275	
12	27 x 66†	139.5	3200	5275	
13	27 x 60	156.5	3500	5775	
13	27 x 72†	151.	3500	5775	
14	27 x 60	168.	3800	6275	
14	27 x 78†	162.5	3800	6275	

Total Height.....80 in. Total Width, Steam Boiler .56 in.  
 Height of Water Line.....57 in. Total Width, Water Boiler .59 in.

† Maximum size of Fire Pot, not shipped as regular.

\* FOR COMPUTING SIZE OF BOILER SEE PAGE 4

## No. 27 Mercer Boilers

## NO. 27 MERCER RETURN FLUE BOILER

Maximum Allowable Working Pressure—Steam 15 lb., Water 30 lb.

A.S.M.E. Standard

Tested at 60 lb. per sq. in. Hydrostatic Pressure

## DIMENSIONS

Number of Sections	Nominal Size of Fire Pot inches	Total Length of Boiler inches	Length of Fire Pot inches	Length at Foundation inches	Diameter of Smoke Pipe Opening inches
6	27 x 30	46	30	38	12
7	27 x 36	52	36	44	12
8	27 x 42	58	42	50	12
9	27 x 48	64	48	56	12
10	27 x 54	70	54	62	12
11	27 x 54	76	54	68	12
11	27 x 60*	76	60*	68	12
12	27 x 54	82	54	74	12
12	27 x 66*	82	66*	74	12
13	27 x 60	88	60	80	12
13	27 x 72*	88	72*	80	12
14	27 x 60	94	60	86	12
14	27 x 78*	94	78*	86	12

Width at foundation.... 35 in. Dist. betw. center of grates.... 6 in.  
 Width of boiler..... 51 in. Outside dia. supply drum ... 8 in.  
 Width of boiler, steam... 56 in. Outside dia. return drums, steam  $4\frac{1}{2}$  in.  
 Width of boiler, water... 59 in. Outside dia. return drums, water, 6 in.  
 Height of boiler,..... 80 in. Size of supply drum nipples 2  $\times$  6 in.  
 Height of water line.... 57 in. Size of return drum nipples  $1\frac{1}{4}$   $\times$  6 in.  
 Height of ash pit..... 16 in. Distance from floor to smoke  
 Length of Grate Bar... 27 in. pipe opening ..... 55 in.

SAFETY VALVE AND WATER RELIEF VALVE SIZES  
A.S.M.E. Standard

Number of Sections in Boiler	Size of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15	0-25	25-30
			Size Steam Safety Valve, inches	Size Water Relief Valves	inches
6	27 x 30	5.63	2	2	2
7	27 x 36	6.75	2	2	2
8	27 x 42	7.88	2	2	2
9	27 x 48	9.00	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2
10	27 x 54	10.13	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
11†	27 x 54†	10.13	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
11	27 x 60	11.25	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
12†	27 x 54†	10.13	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
12	27 x 60	11.25	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
12	27 x 66	12.38	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
13†	27 x 60†	11.25	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
13	27 x 66	12.38	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
13	27 x 72	13.50	3	3	2 $\frac{1}{2}$
14†	27 x 60†	11.25	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
14	27 x 66	12.38	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
14	27 x 72	13.50	3	3	2 $\frac{1}{2}$
14	27 x 78	14.63	3	3	2 $\frac{1}{2}$

NOTE—\* Maximum size of Fire Pot; not shipped as regular.

† Size of grate shipped unless otherwise specified.

No. 27 Mercer Boilers

NO. 27 MERCER RETURN FLUE BOILER  
REGULAR TAPPINGS \*

SUPPLY DRUM

Outside diameter..... 8 in.  
Tapped for 2 in. Lock-Nut  
Nipples  
Each end tapped..... 2½ in.

TAPPINGS ON TOP  
OF SUPPLY DRUM

Number of Sections	Size of Tappings, in				
	2	2½	3	4	5
Ste'm	Wat'r	Number of Tappings			
6	6	1	2	1	-
6	7	1	2	1	-
7	8	1	2	1	-
8	9	-	1	1	1
9	10	-	1	1	1
10	11	-	1	1	1
11	12	-	1	1	1
12	13	-	-	1	1
13	14	-	-	1	2
14	-	-	-	1	2

52

RETURN DRUMS

STEAM BOILERS:  
Outside diameter..... 4½ in.  
Tapped for 1½ in. Lock-Nut  
Nipples  
Side tapped..... 2 in.  
Underside tapped..... 1½ in.  
6-10 sections:  
Each end tapped..... 2½ in.  
11-14 sections:  
Front ends tapped..... 2½ in.  
Rear ends tapped..... 3 in.

WATER BOILERS:

Outside diameter..... 6 in.  
Tapped for 1½ in.  
Lock-Nut Nipples  
Underside tapped..... 1½ in.  
6-8 sections:  
Front ends tapped..... 2½ in.  
Rear ends tapped..... 4 in.  
Side tapped..... 2 in.  
9-12 sections:  
Front ends tapped..... 2½ in.  
Rear ends tapped..... 5 in.  
Side tapped..... 2 in.  
13 and 14 sections:  
Front ends tapped, one 2½,  
one 5 in.  
Rear ends tapped, one 2½,  
one 5 in.  
Side tapped, one 4, one 2 in.

FIRE TOOLS FURNISHED

Flue brush (with handle), boe, poker, and asb shovel.

TRIMMINGS FURNISHED WITH STEAM BOILERS

Water column, gauge cock, water-gauge cock, water-gauge glass, steam gauge (with cock), steam-gauge siphon. Damper regulator complete with chain.

ASBESTOS PLASTER

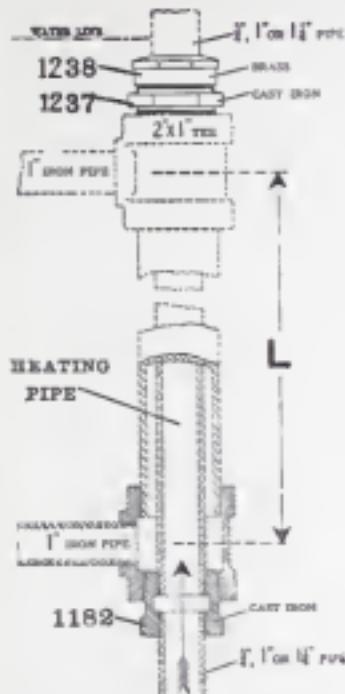
Plaster is furnished in order that the joints between the sections can be made and the boiler fired before covering the boiler complete. A sufficient amount of plaster is furnished for this purpose only.

RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the taller chimneys may be necessary.					
	Diam. inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
6	12	75	13	50	14	35
7	13	75	14	50	15	35
8	14	75	15	50	16	35
9	15	75	16	50	17	40
10	15	80	16	60	17	40
11	16	80	17	60	18	40
12	16	100	17	75	18	50
13	16	100	17	75	18	50
14	17	100	18	75	19	50

\* Tappings other than those listed are special, order must specify sizes.

# Heating Capacities of Hot Water Supply Fittings with Brass and Iron Pipe



At the left is shown an arrangement of pipe and fittings used in connection with a steam or water boiler and as a substitute for a water back for furnishing a supply of hot water.

The upper horizontal 1-inch iron pipe is connected to the heating boiler not less than 4 inches below the water line in the case of a steam boiler or in a corresponding position on a water boiler. The lower one may be connected to a return main or directly to the lower part of the boiler. The hot water supply pipe enters at the bottom and leaves thru the stuffing box at the top. The pipes and fittings should be covered with heat insulating material.

The heating capacity of this arrangement depends upon several factors:

- (1) The initial and the final temperatures of the water to be heated.
- (2) The length ( $L$ ) and the diameter of the heating pipe.
- (3) The material of the heating pipe, whether brass or iron.

53

- (4) The condition of the heating pipe and the freedom of circulation thru and around it.

The heat given to the supply water reduces the house heating capacity of the boiler or increases the load on it by an equivalent amount and this should be taken into account when selecting the boiler.

The following tables can be used in calculating the gallons of water per hour which it is possible to heat from one temperature to another and the number of feet of steam radiation to which it is equivalent.

The tables have been calculated on the following bases:

- (1) On one foot length of  $\frac{3}{4}$  inch brass heating pipe
  - (a) for any other length multiply by the length in feet
  - (b) for one foot of 1 inch brass pipe multiply by 1.25
  - for one foot of  $1\frac{1}{4}$  inch brass pipe multiply by 1.5
  - (c) for iron pipe multiply by 0.65 the results for corresponding length and size of brass pipe.
- (2) The capacities given are for clean pipe with free circulation.
  - (a) In practice, to allow for fouling of pipe and retarded circulation, the capacities should be reduced to  $\frac{3}{4}$  or  $\frac{1}{2}$  of those given by the use of the tables.

The following examples illustrate the application of tables.

(1) Data given: Temperature of water in steam heating boiler,  $200^{\circ}$ . Distance between boiler connections, 3 feet. Size and material of heating pipe, 1 inch iron. Initial temperature of water to be heated,  $60^{\circ}$ . Final temperature of water to be heated,  $140^{\circ}$ .

Wanted: Gallons of water which can be heated per hour and the feet of steam radiation added to the load on the boiler.

From the  $200^{\circ}$  table under the  $140^{\circ}$  final temperature column and on the  $60^{\circ}$  initial temperature line, the gal. per hr. are given as 18.2 and the steam radiation as 50.

The length of heating pipe is 3 feet. Correction for length,  $18.2 \times 3 = 54.6$ . Correction for size,  $54.6 \times 1.25 = 68.2$ . Correction for iron pipe  $68.2 \times 0.65 = 44.3$ . Allowance for fouling, etc.  $44.3 \times \frac{1}{2} = 22$  gal. per hr. Similarly for the radiation = 61 feet of steam radiation.

## Hot Water Supply Fittings

(2) An hourly supply of 24 gallons of hot water at a temperature of  $160^{\circ}$  is wanted. The initial temperature of the water is  $80^{\circ}$ . If the water in the hot water heating boiler is at  $180^{\circ}$  and the length of the heating pipe can be four feet what size brass pipe should be used?

If it is assumed that  $\frac{3}{4}$  of the clean pipe capacity will be secured, then provision should be made for  $24 \div \frac{3}{4} = 36$  gal. per hour.

For each foot of length,  $36 \div 4 = 9.0$  gal. per hour.

From the  $180^{\circ}$  table it is shown that one foot of  $\frac{3}{4}$  inch brass pipe will heat 6 gal. per hr. from  $80^{\circ}$  to  $160^{\circ}$ .

For 1-inch brass,  $6 \times 1.25 = 7.5$  gal. per hr. (not enough)

For  $1\frac{1}{4}$ -inch brass  $6 \times 1.5 = 9.0$  gal. per hr. (just sufficient)

Therefore it would be necessary to use the  $1\frac{1}{4}$  inch pipe and fittings.

The added load on the boiler may be found as in the previous example and then multiplying by 1.65 to give the feet of water radiation.

CAPACITY OF HOT WATER SUPPLY FITTINGS WITH ONE FOOT OF CLEAN  $\frac{3}{4}$ -INCH BRASS PIPE

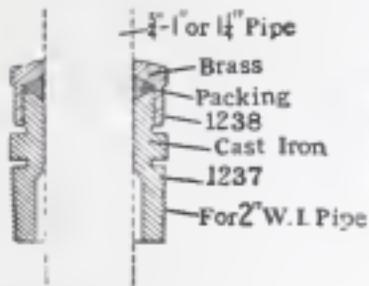
Temp. of Water in Boiler	Initial Temp. of Supply Water	Final Temp. of Supply Water						For Water Radiation Multiply Steam Radiation by 1.65
		$200^{\circ}$	$180^{\circ}$	$160^{\circ}$	$140^{\circ}$	$120^{\circ}$	$100^{\circ}$	
220 deg. corresponding to $2\frac{1}{2}$ lb. steam pressure	40°	5.6	10.	15.4	25.	34.	52.	87.
		32.	48.	64.	80.	93.	108.	119.
	60°	5.7	10.5	16.2	26.	40.	71.	159.
		27.	43.	56.	70.	83.	98.	109.
	80°	5.7	10.7	18.2	30.	53.	124.	...
		24.	37.	50.	61.	73.	85.	...
200 deg. corresponding to 7-inch vacuum	100°	5.8	11.6	20.6	39.	91.	...	...
		20.	32.	43.	53.	62.	...	...
	120°	6.0	12.7	25.6	66.	...	...	...
		16.	26.	35.	45.	...	...	...
	40°	...	5.7	10.5	16.2	25.7	40.3	71.
		...	27.	43.	56.	70.	83.	98.
180 deg.	60°	...	5.7	10.7	18.2	29.8	53.	124.
		...	24.	37.	50.	61.	73.	85.
	80°	...	5.8	11.6	20.6	38.9	91.	...
		...	20.	32.	43.	53.	62.	...
	100°	...	6.0	12.7	25.6	66.2	...	...
		...	16.	26.	35.	45.	...	...
160 deg.	120°	...	6.2	15.3	42.4	...	...	...
		...	13.	21.	29.	...	...	...
	40°	...	...	5.8	11.6	20.6	39.8	71.
		...	...	20.	32.	43.	53.	62.
	60°	...	...	6.0	12.7	25.6	66.2	...
		...	...	16.	26.	35.	45.	...
140 deg.	80°	...	...	6.2	15.3	42.4	...	...
		...	...	13.	21.	29.	...	...
	100°	...	...	6.8	23.2	...	...	...
		...	...	9.3	16.	...	...	...
	120°	...	...	9.6	...	...	...	...
		...	...	6.6	...	...	...	...
	40°	...	...	...	6.0	12.7	25.6	71.
		...	...	...	16.	26.	35.	45.
	60°	...	...	...	6.2	15.3	42.4	...
		...	...	...	13.	21.	29.	...
	80°	...	...	...	6.8	23.2	...	...
		...	...	...	9.3	16.	...	...
	100°	...	...	...	9.6	...	...	...
		...	...	...	6.6	...	...	...

## Hot Water Supply Fittings

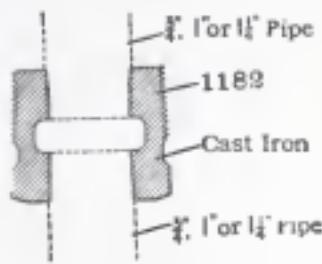
### FITTINGS SHIPPED FOR 2" W. I. PIPE

1 fitting 1237 with brass stuffing box 1238 (3/4", 1", 1 1/4") iron pipe sizes.

1 fitting 1182 (3/4", 1", 1 1/4") iron pipe sizes.



Hot Water Supply Fittings  
(1237-1238)



Hot Water Supply Fittings  
(1182)

BOILER	<sup>L</sup> Inches
No. 24 Mills	27 1/2
No. 34	40
No. 44	45
No. 48	72
No. 36 Smith	35
No. 60	53
No. 18 Mercer	31
No. 27	33
No. 36	35
Nos. 16-18 Menlo	25
No. 20	26
No. 15 H-B	21
No. 215	27
Nos. 217-219	31
Nos. 317-319	38
Nos. 221-223	30 1/2
Nos. 321-323	37 1/2
Nos. 224-227	30
Nos. 324-327	37 1/2

**L**—Approximate Length of Heating Pipe  
See illustration on page 53

## Direct Radiators



56

Two-Column Princess—Steam



Two-Column Princess—Water

## DIRECT RADIATORS



Push Nipple

MALLEABLE IRON PUSH NIPPLE CONNECTION FOR  
DIRECT RADIATORS

RADIATOR SECTIONS are bored or milled to gauge with a taper of  $\frac{3}{8}$  of an inch to the foot.

*The standard taper of wrought iron pipe threads is  $\frac{3}{4}$  of an inch to the foot.*

57

PUSH NIPPLES: The surface is crowning, lathe turned under a copious stream of lubricant, which gives a smooth "water polish."

The above, in brief, is a description of the method of producing our malleable iron push nipple connection, so long acknowledged by the trade to be **PERFECT** and **INDESTRUCTIBLE** under working conditions.



Sectional View

Direct Radiators

DIRECT RADIATORS



58

Princemus—Single Column



Princemus—Three Column

See list of sizes for Princemus tables on pages 61-62, 63 and 64.

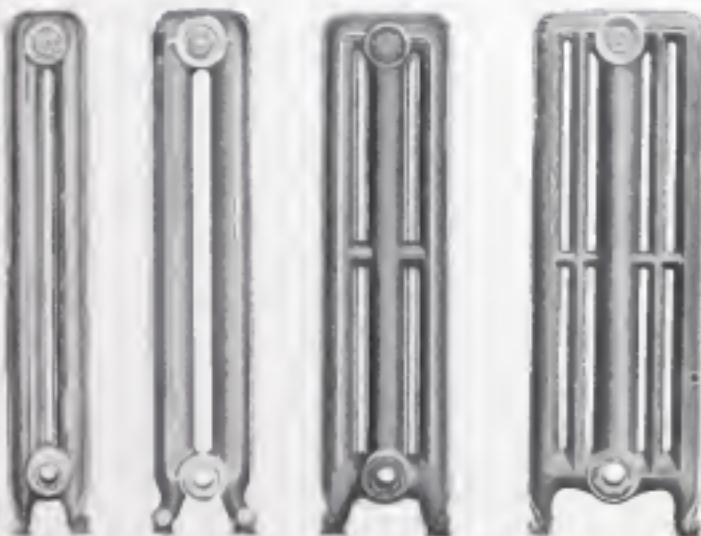
DIRECT RADIATORS



59

Princess—Five-Column

END VIEWS



Single-Column

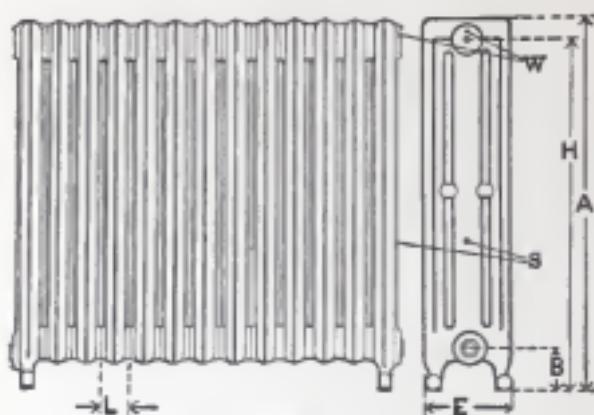
Two-Column

Three-Column

Five-Column

## Direct Radiators

### PRINCESS DIRECT RADIATORS



DIMENSIONS IN INCHES

Radiator Columns	Princess			Five Column		
	Single Column	Two Column	Three Column	Heights 37 and 25		16, 14, 12
	E	L	A	B		
E Width of section...	5 1/4	7	9	12		12
L Length of section...	3	3	3 1/4	3 1/4		3 1/4
B Height to center of regular tapping	4 5/8	4 5/8	4 5/8	4 5/8		3

#### SINGLE COLUMN

A Total Height....	45	37	31	25	22	19
H Height of Top Tapping, Princess	43 1/8	34 1/8	28 1/8	23	20	17

#### TWO COLUMN

A Total Height....	45	37	31	25	22	19
H Height of Top Tapping, Princess	43	35	29	23	20	17

#### THREE COLUMN

A Total Height...	45	37	31	25	22	19
H Height of Top Tapping, Princess	43	35	29 1/8	23 1/8	20	17 1/8

#### FIVE COLUMN

A Total Height.....	37	25	16	14	12
H Height of Top Tapping, Princess	35	23	14	12	10

S = Location of air vent tapping, steam.

W = Location of air vent tapping, water.

PRINCESS DIRECT RADIATORS  
STEAM OR WATER

## Single-Column

## Radiating Surface in Feet

Sec- tions	Total Length ft. - in.	HEIGHT, INCHES					
		45	37	31	25	22	19
		4 1/2 ft. per sec.	3 1/2 ft. per sec.	3 ft. per sec.	2 1/2 ft. per sec.	2 1/4 ft. per sec.	2 ft. per sec.
3	0 - 10	13 1/2	10 1/2	9	7 1/2	6 1/4	6
4	1 - 1	18	14	12	10	9	8
5	1 - 4	22 1/2	17 1/2	15	12 1/4	11 1/4	10
6	1 - 7	27	21	18	15	13 1/2	12
7	1 - 10	31 1/2	24 1/2	21	17 1/4	15 1/4	14
8	2 - 1	36	28	24	20	18	16
9	2 - 4	40 1/2	31 1/2	27	22 1/4	20 1/4	18
10	2 - 7	45	35	30	25	22 1/2	20
11	2 - 10	49 1/2	38 1/2	33	27 1/4	24 1/4	22
12	3 - 1	54	42	36	30	27	24
13	3 - 4	58 1/2	45 1/2	39	32 1/4	29 1/4	26
14	3 - 7	63	49	42	35	31 1/2	28
15	3 - 10	67 1/2	52 1/2	45	37 1/2	33 1/2	30
16	4 - 1	72	56	48	40	36	32
17	4 - 4	76 1/2	59 1/2	51	42 1/2	38 1/2	34
18	4 - 7	81	63	54	45	40 1/2	36
19	4 - 10	85 1/2	66 1/2	57	47 1/2	42 1/2	38
20	5 - 1	90	70	60	50	45	40
21	5 - 4	94 1/2	73 1/2	63	52 1/2	47 1/2	42
22	5 - 7	99	77	66	55	49 1/2	44
23	5 - 10	103 1/2	80 1/2	69	57 1/2	51 1/2	46
24	6 - 1	108	84	72	60	54	48
25	6 - 4	112 1/2	87 1/2	75	62 1/2	56 1/2	50
26	6 - 7	117	91	78	65	58 1/2	52
27	6 - 10	121 1/2	94 1/2	81	67 1/2	60 1/2	54
28	7 - 1	126	98	84	70	63	56
29	7 - 4	130 1/2	101 1/2	87	72 1/2	65 1/2	58
30	7 - 7	135	105	90	75	67 1/2	60

61

## DIMENSIONS

See page 60

Width of Section .....	5 1/4 in.
Length of Section .....	3 in.
Height to Center of Regular Tapping .....	4 5/8 in.

REGULAR TAPPING, SEE PAGE 80

## Direct Radiators

PRINCESS DIRECT RADIATORS  
STEAM OR WATER

## Two-Column

## Radiating Surface in Feet

Sec-tions	Total Length ft. - in.	HEIGHT, INCHES					
		45	37	31	25	22	19
		5 ft. per sec.	4 ft. per sec.	3 $\frac{1}{2}$ ft. per sec.	3 ft. per sec.	2 $\frac{3}{4}$ ft. per sec.	2 $\frac{1}{4}$ ft. per sec.
<b>3</b>	0 - 10	15	12	10 $\frac{1}{4}$	9	7 $\frac{3}{4}$	6 $\frac{3}{4}$
<b>4</b>	1 - 1	20	16	14	12	10 $\frac{1}{2}$	9
<b>5</b>	1 - 4	25	20	17 $\frac{1}{4}$	15	13 $\frac{1}{2}$	11 $\frac{1}{4}$
<b>6</b>	1 - 7	30	24	21	18	15 $\frac{3}{4}$	13 $\frac{1}{2}$
<b>7</b>	1 - 10	35	28	24 $\frac{1}{2}$	21	18 $\frac{1}{4}$	15 $\frac{1}{4}$
<b>8</b>	2 - 1	40	32	28	24	21	18
<b>9</b>	2 - 4	45	36	31 $\frac{1}{2}$	27	23 $\frac{3}{4}$	20 $\frac{1}{4}$
<b>10</b>	2 - 7	50	40	35	30	26 $\frac{1}{4}$	22 $\frac{1}{2}$
<b>62</b>	<b>11</b> 2 - 10	55	44	38 $\frac{1}{2}$	33	28 $\frac{1}{2}$	24 $\frac{3}{4}$
	<b>12</b> 3 - 1	60	48	42	36	31 $\frac{1}{2}$	27
	<b>13</b> 3 - 4	65	52	45 $\frac{1}{2}$	39	34 $\frac{1}{2}$	29 $\frac{1}{4}$
	<b>14</b> 3 - 7	70	56	49	42	36 $\frac{3}{4}$	31 $\frac{1}{2}$
	<b>15</b> 3 - 10	75	60	52 $\frac{1}{2}$	45	39 $\frac{3}{8}$	33 $\frac{3}{4}$
	<b>16</b> 4 - 1	80	64	56	48	42	36
	<b>17</b> 4 - 4	85	68	59 $\frac{1}{2}$	51	44 $\frac{1}{2}$	38 $\frac{1}{4}$
	<b>18</b> 4 - 7	90	72	63	54	47 $\frac{1}{4}$	40 $\frac{1}{2}$
	<b>19</b> 4 - 10	95	76	66 $\frac{1}{2}$	57	49 $\frac{1}{2}$	42 $\frac{3}{4}$
	<b>20</b> 5 - 1	100	80	70	60	52 $\frac{1}{2}$	45
	<b>21</b> 5 - 4	105	84	73 $\frac{1}{2}$	63	55 $\frac{1}{4}$	47 $\frac{1}{4}$
	<b>22</b> 5 - 7	110	88	77	66	57 $\frac{3}{4}$	49 $\frac{1}{2}$
	<b>23</b> 5 - 10	115	92	80 $\frac{1}{2}$	69	60 $\frac{3}{4}$	51 $\frac{1}{4}$
	<b>24</b> 6 - 1	120	96	84	72	63	54
	<b>25</b> 6 - 4	125	100	87 $\frac{1}{2}$	75	65 $\frac{3}{8}$	56 $\frac{1}{4}$
	<b>26</b> 6 - 7	130	104	91	78	68 $\frac{1}{4}$	58 $\frac{1}{2}$
	<b>27</b> 6 - 10	135	108	94 $\frac{1}{2}$	81	70 $\frac{3}{8}$	60 $\frac{3}{4}$
	<b>28</b> 7 - 1	140	112	98	84	73 $\frac{3}{4}$	63
	<b>29</b> 7 - 4	145	116	101 $\frac{1}{2}$	87	76 $\frac{1}{8}$	65 $\frac{1}{4}$
	<b>30</b> 7 - 7	150	120	105	90	78 $\frac{3}{4}$	67 $\frac{1}{2}$

## DIMENSIONS

See page 60

Width of Section . . . . .	7 in.
Length of Section . . . . .	3 in.
Height to Center of Regular Tapping . . . . .	4 $\frac{1}{2}$ in.

REGULAR TAPPING, SEE PAGE 80

PRINCESS DIRECT RADIATORS  
STEAM OR WATER

## Three-Column

Radiating Surface in Feet

Sections	Total Length ft. - in	HEIGHT, INCHES					
		45	37	31	25	22	19
		8 ft. per sec.	6½ ft. per sec.	5½ ft. per sec.	4½ ft. per sec.	4 ft. per sec.	3½ ft. per sec.
3	0 - 10½	24	19½	16½	13½	12	10½
4	1 - 2	32	26	22	18	16	14
5	1 - 5½	40	32½	27½	22½	20	17½
6	1 - 8½	48	39	33	27	24	21
7	1 - 11½	56	45½	38½	31½	28	24½
8	2 - 3	64	52	44	36	32	28
9	2 - 6½	72	58½	49½	40½	36	31½
10	2 - 9½	80	65	55	45	40	35
11	3 - ¾	88	71½	60½	49½	44	38½
12	3 - 4	96	78	66	54	48	42
13	3 - 7½	104	84½	71½	58½	52	45½
14	3 - 10½	112	91	77	63	56	49
15	4 - 1¾	120	97½	82½	67½	60	52½
16	4 - 5	128	104	88	72	64	56
17	4 - 8½	136	110½	93½	76½	68	59½
18	4 - 11½	144	117	99	81	72	63
19	5 - 2½	152	123½	104½	85½	76	66½
20	5 - 6	160	130	110	90	80	70
21	5 - 9½	168	136½	115½	94½	84	73½
22	6 - 1½	176	143	121	99	88	77
23	6 - 3½	184	149½	126½	103½	92	80½
24	6 - 7	192	156	132	108	96	84
25	6 - 10½	200	162½	137½	112½	100	87½
26	7 - 1½	208	169	143	117	104	91
27	7 - 4½	216	175½	148½	121½	108	94½
28	7 - 8	224	182	154	126	112	98
29	7 - 11½	232	188½	159½	130½	116	101½
30	8 - 2½	240	195	165	135	120	105

## DIMENSIONS

See page 60

Width of Section.....	9 in.
Length of Section.....	3½ in.
Height to Center of Regular Tapping.....	4½ in.

REGULAR TAPPING, SEE PAGE 80

## Direct Radiators

PRINCESS DIRECT RADIATORS  
STEAM OR WATER

## Five-Column

## Radiating Surface in Feet

Sec- tions	Total Length	HEIGHT, INCHES					
		37	25	16	14	12	
		10 ft. per sec.	7 ft. per sec.	4 $\frac{1}{2}$ ft. per sec.	4 ft. per sec.	3 $\frac{1}{2}$ ft. per sec.	
3	0 - 10 $\frac{1}{4}$	30	21	14	12	10	
4	1 - 2	40	28	18 $\frac{1}{4}$	16	13 $\frac{1}{4}$	
5	1 - 5 $\frac{1}{4}$	50	35	23 $\frac{1}{4}$	20	16 $\frac{1}{4}$	
6	1 - 8 $\frac{1}{2}$	60	42	28	24	20	
7	1 - 11 $\frac{1}{4}$	70	49	32 $\frac{1}{4}$	28	23 $\frac{1}{4}$	
8	2 - 3	80	56	37 $\frac{1}{4}$	32	26 $\frac{1}{4}$	
9	2 - 6 $\frac{1}{4}$	90	63	42	36	30	
10	2 - 9 $\frac{1}{2}$	100	70	46 $\frac{1}{4}$	40	33 $\frac{1}{4}$	
11	3 - $\frac{1}{4}$	110	77	51 $\frac{1}{4}$	44	36 $\frac{1}{4}$	
12	3 - 4	120	84	56	48	40	
13	3 - 7 $\frac{1}{4}$	130	91	60 $\frac{1}{4}$	52	43 $\frac{1}{4}$	
14	3 - 10 $\frac{1}{2}$	140	98	65 $\frac{1}{4}$	56	46 $\frac{1}{4}$	
15	4 - 1 $\frac{1}{4}$	150	105	70	60	50	
16	4 - 5	160	112	74 $\frac{1}{4}$	64	53 $\frac{1}{4}$	
17	4 - 8 $\frac{1}{4}$	170	119	79 $\frac{1}{4}$	68	56 $\frac{1}{4}$	
18	4 - 11 $\frac{1}{2}$	180	126	84	72	60	
19	5 - 2 $\frac{1}{4}$	190	133	88 $\frac{1}{4}$	76	63 $\frac{1}{4}$	
20	5 - 6	200	140	93 $\frac{1}{4}$	80	66 $\frac{1}{4}$	
21	5 - 9 $\frac{1}{4}$	210	147	98	84	70	
22	6 - $\frac{1}{2}$	220	154	102 $\frac{1}{4}$	88	73 $\frac{1}{4}$	
23	6 - 3 $\frac{1}{4}$	230	161	107 $\frac{1}{4}$	92	76 $\frac{1}{4}$	
24	6 - 7	240	168	112	96	80	
25	6 - 10 $\frac{1}{4}$	250	175	116 $\frac{1}{4}$	100	83 $\frac{1}{4}$	
26	7 - 11 $\frac{1}{4}$	260	182	121 $\frac{1}{4}$	104	86 $\frac{1}{4}$	
27	7 - 4 $\frac{1}{4}$	270	189	126	108	90	
28	7 - 8	280	196	130 $\frac{1}{4}$	112	93 $\frac{1}{4}$	
29	7 - 11 $\frac{1}{4}$	290	203	135 $\frac{1}{4}$	116	96 $\frac{1}{4}$	
30	8 - 2 $\frac{1}{2}$	300	210	140	120	100	

## DIMENSIONS

See Page 60

Width of Section.....	.....	12 in.
Length of Section.....	.....	3 $\frac{1}{4}$ in.
Height to Center of Regular Tapping, 37 in. and 25 in.....	.....	4 $\frac{1}{4}$ in.
Height to Center of Regular Tapping, 16 in., 14 in. and 12 in.	.....	3 in.

# Special Radiator Zigzag Rule

for

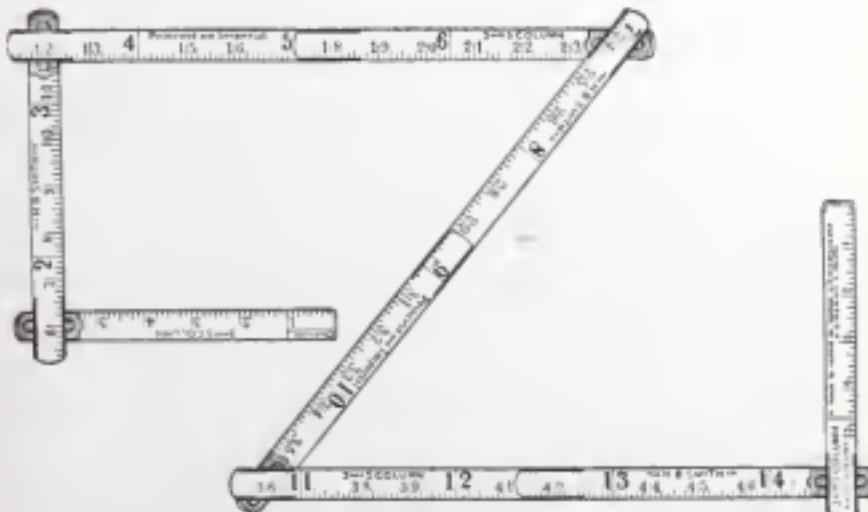
## Princess Radiators



This side of rule printed in black ink for 1 and 2 column Princess Radiators

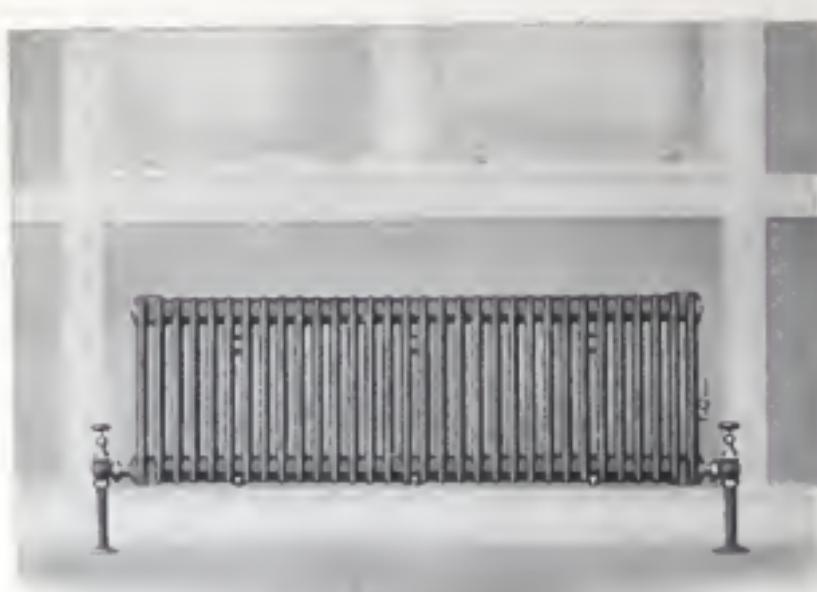
65

Large figures indicate number of sections of Radiator in length including two bushings.



This side of rule printed in red ink for 3 and 5 column Princess Radiators.

## Princess Wall Radiator



### PRINCESS WALL RADIATORS

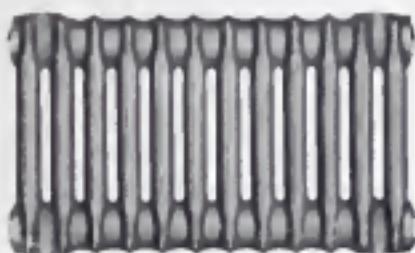
**ADAPTABLE:** Princess Wall Radiators are adapted for all places where direct radiators or pipe coils may be used. They are especially desirable where floor space is valuable and wall, column or ceiling space is more available.

**FLEXIBILITY:** Princess Wall Radiators possess extreme flexibility of size and arrangement. They can be installed with surfaces from five feet up, in multiples of two and one half feet, with corresponding lengths from nine inches up in multiples of four inches, in the 22-inch radiator; and from 13 inches up in multiples of six inches, in the 15-inch radiator. They can be arranged in tiers by combinations of these heights either for horizontal runs or for column work. Hung horizontally they make excellent ceiling radiators.

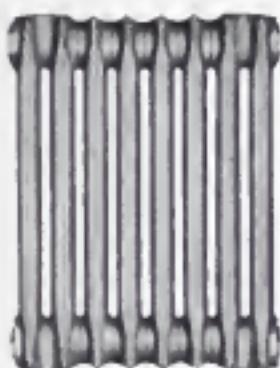
**STEAM AND WATER:** Princess Wall Radiators for WATER have all nipple connections between groups, thereby giving continuous passages at both top and bottom. For STEAM, the top connection at intervals is a plug instead of a nipple. This prevents the radiator from becoming air bound, decreases the time required for heating it throughout and increases its efficiency. Steam radiators cannot be used for water; however, water radiators can, but should not, be used for steam.

**CONNECTIONS:** Princess Wall Radiators have the supply and return tappings located as given in the table on page 71. These regular tappings are horizontal, but if necessary, and so ordered, they can be made vertical.

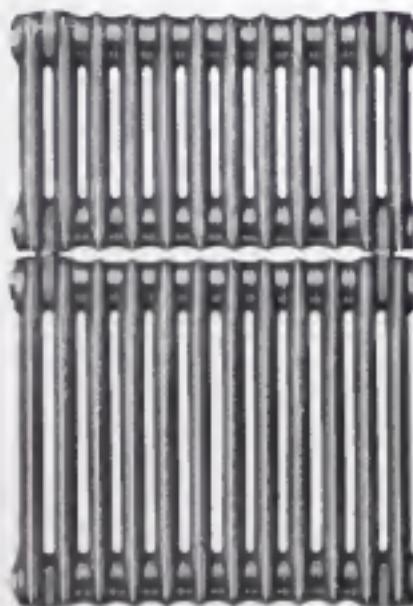
PRINCESS WALL RADIATORS



16-Inch Height  
10-Foot Radiator  
12 tubes in length



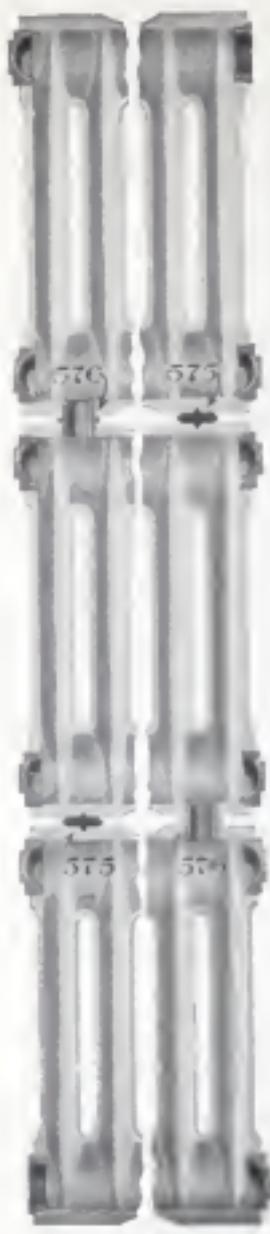
22-Inch Height  
10-Foot Radiator  
8 tubes in length



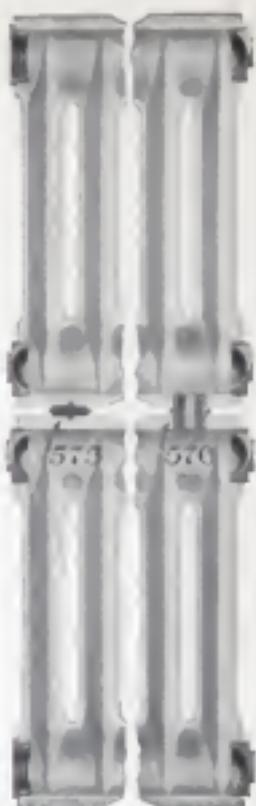
37-Inch Height  
25-Foot Radiator  
2 tubes in length

## Wall Radiators

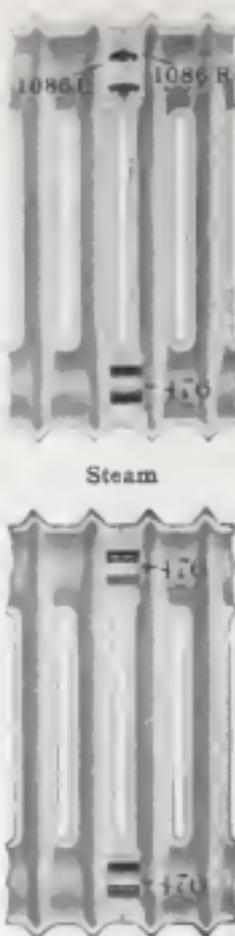
68



Three Tiers High



Two Tiers High



Water

R. and L. 1 $\frac{3}{4}$ -in. Plugs (1086 L. and 1086 R.) in position. For assembling Groups in STEAM Radiators, Top only.  
R. and L. 1 $\frac{3}{4}$ -in. Nipples (476) in position. For assembling Groups in STEAM Radiators, Bottom only.  
For assembling Groups in WATER Radiators, Top and Bottom.  
Disk (575) and R. and L. 1 $\frac{3}{4}$ -in. Octagon Nipple (576) in position.  
For assembling tiers when Radiator is more than one tier high.

---

WRENCH No. 474. For assembling Groups, used with Nipples 476.



WRENCH No. 45. For assembling Tiers, used with Nipples 576.



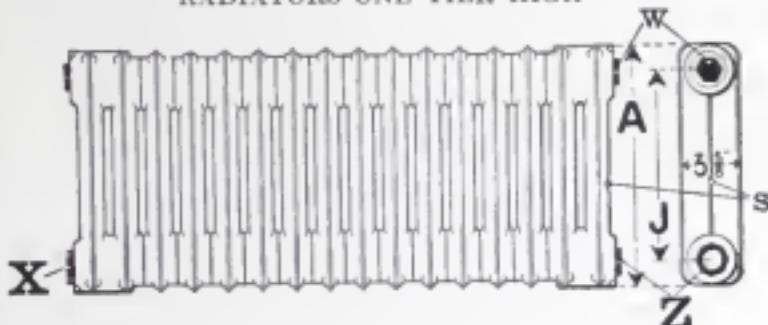
ADJUSTABLE WEDGE

Use adjustable wedge between tiers when radiators exceed 7 feet in length.

Dimensions and Tappings  
**LOCATIONS OF TAPPINGS**

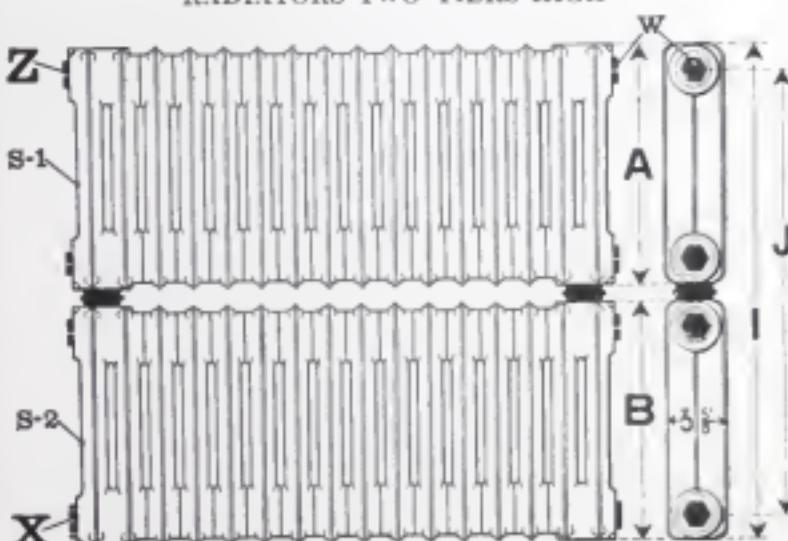
X = Supply tapping; One-Pipe Steam. W = Air vent tapping; Water.  
 X, Z = Return and Supply Tappings; S = Air vent tapping; Steam.  
 Water and Two-Pipe Steam. 1 = One-Pipe work  
 2 = Two-Pipe work.

#### RADIATORS ONE TIER HIGH



Dimensions	15-inch	22-inch
A	14 $\frac{5}{8}$ in.	21 $\frac{1}{2}$ in.
J	11 $\frac{5}{8}$ in.	18 $\frac{1}{2}$ in

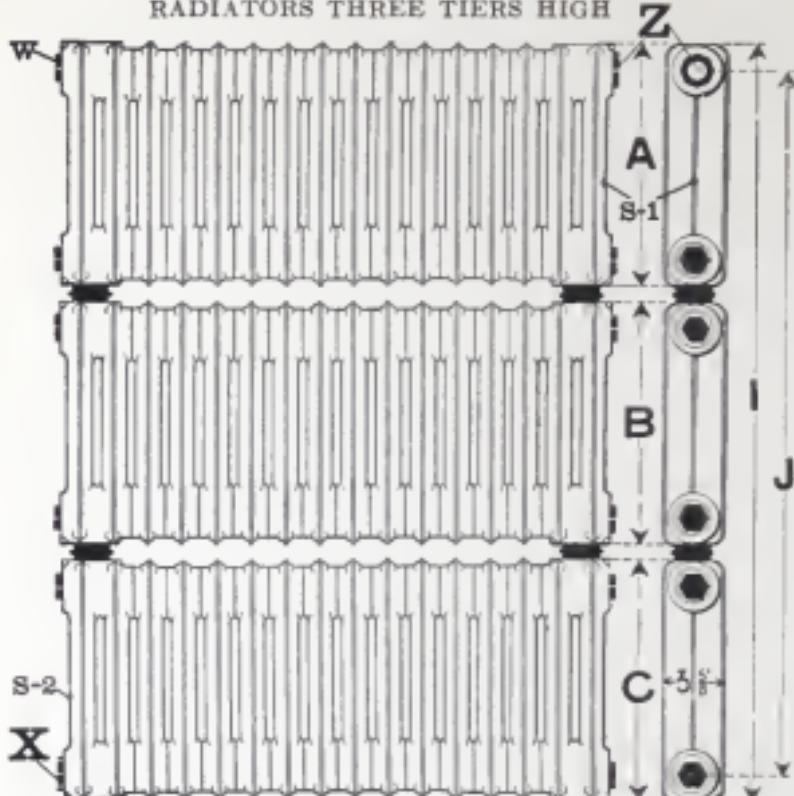
## RADIATORS TWO TIERS HIGH



Dimensions	30-inch	37-inch	44-inch
	15+15	15+22	22+22
<b>A</b>	14 $\frac{5}{8}$ in.	14 $\frac{5}{8}$ in.	21 $\frac{1}{2}$ in.
<b>B</b>	14 $\frac{5}{8}$ in.	21 $\frac{1}{2}$ in.	21 $\frac{1}{2}$ in.
<b>I</b>	29 $\frac{1}{2}$ in.	37 in.	44 $\frac{1}{2}$ in.
<b>J</b>	26 $\frac{3}{8}$ in.	34 in.	41 $\frac{1}{2}$ in.

## Wall Radiators

### RADIATORS THREE TIERS HIGH



70

Dimensions	45 inch	52 inch	59 inch	66 inch
	15 + 15 + 15	22 + 15 + 15	22 + 22 + 15	22 + 22 + 22
A	14 $\frac{3}{8}$ in.	14 $\frac{3}{8}$ in.	14 $\frac{3}{8}$ in.	21 $\frac{1}{2}$ in.
B	14 $\frac{3}{8}$ in.	14 $\frac{3}{8}$ in.	21 $\frac{1}{2}$ in.	21 $\frac{1}{2}$ in.
C	14 $\frac{3}{8}$ in.	21 $\frac{1}{2}$ in.	21 $\frac{1}{2}$ in.	21 $\frac{1}{2}$ in.
I	45 $\frac{3}{8}$ in.	52 $\frac{3}{8}$ in.	59 $\frac{3}{8}$ in.	66 $\frac{3}{8}$ in.
J	42 $\frac{1}{2}$ in.	49 $\frac{1}{2}$ in.	56 $\frac{1}{2}$ in.	63 $\frac{1}{2}$ in.

#### REGULAR TAPPINGS STEAM, TWO-PIPE WORK

Radiators of 50 feet and smaller.....1 in.  $\times$   $\frac{3}{8}$  in.  
Radiators larger than 50 feet and smaller than 120 feet..... $1\frac{1}{4}$  in.  $\times$  1 in.  
Radiators of 120 feet and larger..... $1\frac{1}{2}$  in.  $\times$   $1\frac{1}{4}$  in.

Air valve..... $\frac{3}{8}$  in.  
Radiators 1 tier high—tapped bottom, opposite ends.

Radiators 2, 4, or 6 tiers high—tapped top and bottom, same end.

Radiators 3, 5, or 7 tiers high—tapped top and bottom opposite ends

#### STEAM, ONE-PIPE WORK

Radiators of 30 feet and smaller.....1 in.  
Radiators larger than 30 feet and smaller than 60 feet..... $1\frac{1}{4}$  in.  
Radiators of 60 feet and larger..... $1\frac{1}{2}$  in.  
Air valve..... $\frac{3}{8}$  in.

All Radiators—tapped bottom, one end.

Radiators will be tapped for two-pipe work unless otherwise specified.

#### WATER

Radiators of 50 feet and smaller.....1 in.  $\times$  1 in.  
Radiators larger than 50 feet and smaller than 120 feet..... $1\frac{1}{4}$  in.  $\times$   $1\frac{1}{4}$  in.  
Radiators of 120 feet and larger..... $1\frac{1}{2}$  in.  $\times$   $1\frac{1}{2}$  in.  
Air valve—in the top plug..... $\frac{3}{8}$  in.

Radiators 1 tier high—tapped bottom, opposite ends.

Radiators 2, 4, or 6 tiers high—tapped top and bottom, same end

Radiators 3, 5, or 7 tiers high—tapped top and bottom, opposite ends.

## PRINCESS WALL RADIATOR

## LIST OF SIZES (Arranged According to Surface)

LIST OF SIZES (Arranged According to Surface)

Radiator	ONE TIER HIGH			TWO TIER HIGH			THREE TIER HIGH			45-inch			54-inch			Radiator Actual Height of each Tier	Actual Height of Radiator Height of each Tier		
	15-in.	33-inch		30-inch	37-in.		44-inch	45-inch	53-inch	60 1/2 in.	69 1/2 in.								
		14 1/2 in.	21 1/2 in.		15+16	22+15		15+15+15	22+22+15										
Actual Height of Radiator	15 in.	28 in.	35 in.	30-inch	37 in.	44-inch	45-inch	53-inch	60 1/2 in.	69 1/2 in.	69 1/2 in.								
Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length		
No. of Tubes	No. of Tubes	No. of Tubes	No. of Tubes	No. of Tubes	No. of Tubes	No. of Tubes	No. of Tubes	No. of Tubes	No. of Tubes	No. of Tubes	No. of Tubes	No. of Tubes	No. of Tubes	No. of Tubes	No. of Tubes	No. of Tubes	No. of Tubes		
15	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54		
10 1/2	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57		
12 1/2	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60		
13	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		
17 1/2	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69		
30	34	42	47	52	57	62	67	72	77	82	87	92	97	102	107	112	117		
32 1/2	37	45	51	57	63	69	75	81	87	93	99	105	111	117	123	129	135		
35	40	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138		
37 1/2	35	43	50	56	62	68	74	80	86	92	98	104	110	116	122	128	134		
39	36	44	51	58	64	71	78	85	92	99	106	113	120	127	134	141	148		
32 1/2	39	47	54	61	68	75	82	89	96	103	110	117	124	131	138	145	152		
35	42	50	57	64	71	78	85	92	99	106	113	120	127	134	141	148	155		
37 1/2	37	45	52	59	66	73	80	87	94	101	108	115	122	129	136	143	150		
40	45	53	60	67	74	81	88	95	102	109	116	123	130	137	144	151	158		
42 1/2	51	54	61	68	75	82	89	96	103	110	117	124	131	138	145	152	159		
45	54	61	68	75	82	89	96	103	110	117	124	131	138	145	152	159	166		
47 1/2	57	63	70	77	84	91	98	105	112	119	126	133	140	147	154	161	168		
50	60	67	74	81	88	95	102	109	116	123	130	137	144	151	158	165	172		
52 1/2	63	70	77	84	91	98	105	112	119	126	133	140	147	154	161	168	175		
55	66	73	80	87	94	101	108	115	122	129	136	143	150	157	164	171	178		
57 1/2	69	76	83	90	97	104	111	118	125	132	139	146	153	160	167	174	181		
60	72	79	86	93	100	107	114	121	128	135	142	149	156	163	170	177	184		
62 1/2	75	82	89	96	103	110	117	124	131	138	145	152	159	166	173	180	187		
65	78	85	92	99	106	113	120	127	134	141	148	155	162	169	176	183	190		
67 1/2	81	88	95	102	109	116	123	130	137	144	151	158	165	172	179	186	193		
70	84	91	98	105	112	119	126	133	140	147	154	161	168	175	182	189	196		
72 1/2	87	94	101	108	115	122	129	136	143	150	157	164	171	178	185	192	199		
75	90	97	104	111	118	125	132	139	146	153	160	167	174	181	188	195	202		
77 1/2	93	100	107	114	121	128	135	142	149	156	163	170	177	184	191	198	205		

For Number of Groups in Radiator as shipped, see Page 73.

## PRINCESS WALL RADIATOR

**LIST OF SIZES (Arranged According to Surface)**

## LIST OF SIZES (Arranged According to Surface)

## PRINCESS WALL RADIATOR

## LIST OF SIZES (Arranged According to Length)

Height in Tiers	One Tier High		Two Tiers High				Three Tiers High			
	Radiator	15-in	22-in	30-in	37-in	44-in	45-in	52-in	59-in	66-in
Actual ht. Radiator inches	14 $\frac{1}{8}$	21 $\frac{1}{8}$	29 $\frac{1}{8}$	37	44 $\frac{1}{8}$	45 $\frac{1}{8}$	52 $\frac{1}{8}$	59 $\frac{1}{8}$	66 $\frac{1}{8}$	
Height of each Tier	15	22	15+15	15+22	22+22	15+15 +15	22+15 +15	22+22 +15	22+22 +22	
Total Length ft.-in.	Feet of S'f'ee <sup>G</sup>									
0-9	1 5 1				10 2					15 3
1-1	5 1	7 $\frac{1}{2}$ 1	10 2	12 $\frac{1}{2}$ 2	15 2	15 3	17 $\frac{1}{2}$ 3	20 3	22 $\frac{1}{2}$ 3	
1-5	10 1				20 2					30 3
1-7	7 $\frac{1}{2}$ 1		15 2			22 $\frac{1}{2}$ 3				
1-9		12 $\frac{1}{2}$ 1			25 2					
2-1	10 1	15 1	20 2	25 2	30 2	30 3	35 3	40 3	45 3	37 $\frac{1}{2}$ 3
2-5		17 $\frac{1}{2}$ 1			35 2					52 $\frac{1}{2}$ 3
2-7	12 $\frac{1}{2}$ 1		25 2			37 $\frac{1}{2}$ 3				
2-9		20 1			40 2					
3-1	15 1	12 $\frac{1}{2}$ 1	30 2	37 $\frac{1}{2}$ 2	45 2	45 3	52 $\frac{1}{2}$ 3	60 3	67 $\frac{1}{2}$ 3	
3-5	25 1				50 2					75 3
3-7	17 $\frac{1}{2}$ 1		35 2			52 $\frac{1}{2}$ 3				
3-9		27 $\frac{1}{2}$ 1			55 2					
4-1	20 1	30 1	40 2	50 2	60 2	60 3	70 3	80 3	90 3	82 $\frac{1}{2}$ 3
4-5		32 $\frac{1}{2}$ 1			65 2					97 $\frac{1}{2}$ 3
4-7	22 $\frac{1}{2}$ 1		45 2			67 $\frac{1}{2}$ 3				
4-9		35 1			70 2					
5-1	25 1	137 $\frac{1}{2}$ 1	50 2	62 $\frac{1}{2}$ 2	75 2	75 3	87 $\frac{1}{2}$ 3	100 3	112 $\frac{1}{2}$ 3	105 3
5-5	40 2				80 4					120 6
5-7	27 $\frac{1}{2}$ 2		55 4			82 $\frac{1}{2}$ 6				
5-9		42 $\frac{1}{2}$ 2			85 4					
6-1	30 1	24 $\frac{1}{2}$ 2	60 4	75 4	90 4	90 6	105 6	120 6	135 6	127 $\frac{1}{2}$ 6
6-5		47 $\frac{1}{2}$ 2			95 4					142 $\frac{1}{2}$ 6
6-7	32 $\frac{1}{2}$ 2		65 4			97 $\frac{1}{2}$ 6				
6-9		50 2			100 4					
7-1	35 1	252 $\frac{1}{2}$ 2	70 4	87 $\frac{1}{2}$ 4	105 4	105 6	122 $\frac{1}{2}$ 6	140 6	157 $\frac{1}{2}$ 6	150 6
7-5	55 2				110 4					165 6
7-7	37 $\frac{1}{2}$ 2		75 4			112 $\frac{1}{2}$ 6				
7-9		57 $\frac{1}{2}$ 2			115 4					
8-1	40 1	260 2	80 4	100 4	120 4	120 6	140 6	160 6	180 6	172 $\frac{1}{2}$ 6
8-5		21 $\frac{1}{2}$ 2			125 4					187 $\frac{1}{2}$ 6
8-7	42 $\frac{1}{2}$ 2		85 4			127 $\frac{1}{2}$ 6				
8-9		55 2			130 4					
9-1	45 1	27 $\frac{1}{2}$ 3	90 4	112 $\frac{1}{2}$ 5	135 6	135 6	157 $\frac{1}{2}$ 7	180 6	202 $\frac{1}{2}$ 9	195 6
9-5	70 3				140 6					210 9
9-7	47 $\frac{1}{2}$ 3		95 4			142 $\frac{1}{2}$ 9				
9-9		72 $\frac{1}{2}$ 3			145 6					
10-1	50 1	275 3	100 4	125 5	150 6	150 6	175 7	200 8	225 9	217 $\frac{1}{2}$ 9

G = Number of Groups in Radiator as shipped.

## Brackets and Hangers for Princess Wall Radiators

### Concealed Brackets



Top Bracket  
No. 3  
Use 4 No. 14  
Wood Screws\*

Bottom Bracket  
No. 3  
Use 4 No. 16  
Wood Screws\*



If Radiators are ordered "with brackets" (style not specified), No. 3 will be shipped.



No. 1 Leg  
Use 2 No. 12  
Wood Screws\*



Reducible Bracket used with Nos.  
1 and 2 Bracket

Height from floor to underside  
of Radiator, 12½ in., can be  
reduced to 5 in. by cutting off the  
reducible bracket.

No. 3 top brackets are used with  
Nos. 1 and 2 legs.

\*Wood Screws not furnished.



No. 2 Leg  
Use 2 No. 12  
Wood Screws\*

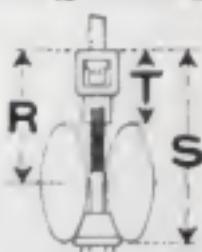
### Princess Adjustable Ceiling Hangers



No. 8 Ceiling Hanger  
C. I. Washer 1½ in. long



No. 9 Ceiling Hanger  
C. I. Washer 6 in. long



#### DIMENSIONS

R—3½ in. to 4½ in.  
S—5 in. to 6 in.  
T—1½ in. to 2½ in.  
Vertical adjustment .1 in.  
Use  $\frac{1}{8}$  in. lag screws or bolts.  
(Not furnished)

## Princess Adjustable Wall Brackets

## NO. 4 BRACKET

## DIMENSIONS

18 in. Radiator

B— $5\frac{3}{4}$  in. to  $3\frac{3}{4}$  in.  
 C— $7\frac{3}{4}$  in. to  $5\frac{3}{4}$  in.  
 D— $5\frac{3}{4}$  in. to  $7\frac{3}{4}$  in.  
 E— $7\frac{3}{4}$  in. to  $9\frac{3}{4}$  in.  
 G—8 in.  
 H— $12\frac{3}{4}$  in.  
 J—4 in.  
 K— $9\frac{1}{2}$  in.

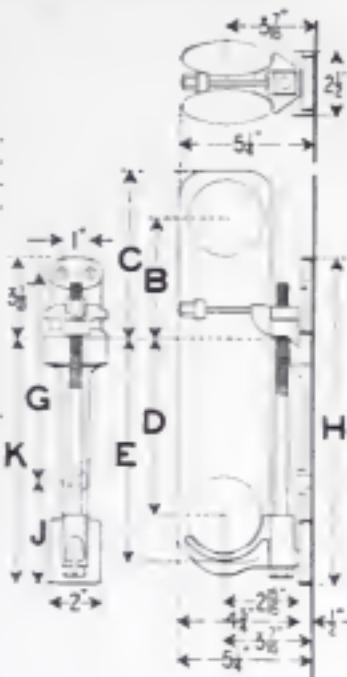
22 in. Radiator

B— $6\frac{3}{4}$  in. to  $8\frac{1}{4}$  in.  
 C— $7\frac{3}{4}$  in. to  $9\frac{3}{4}$  in.  
 D— $10\frac{1}{2}$  in. to  $12\frac{1}{2}$  in.  
 E—12 in. to 14 in.  
 G—10 in.  
 H— $17\frac{3}{4}$  in.  
 J—7 in.  
 K— $14\frac{3}{4}$  in.



No. 4 Bracket

Vertical adjustment.....2 in.  
 Horizontal adjustment....2 in.

Use  $\frac{3}{8}$  in. lag screws or No. 20 Wood screws. (Not furnished.)

## NO. 5\_BRACKET

## DIMENSIONS

18 in Radiator

A— $12\frac{3}{4}$  in.  
 B— $5\frac{3}{4}$  in. to  $3\frac{3}{4}$  in.  
 C— $7\frac{3}{4}$  in. to  $5\frac{3}{4}$  in.  
 D— $5\frac{3}{4}$  in. to  $7\frac{3}{4}$  in.  
 E— $7\frac{3}{4}$  in. to  $9\frac{3}{4}$  in.  
 F— $9\frac{1}{2}$  in.  
 M— $7\frac{3}{4}$  in.  
 N—5 in.

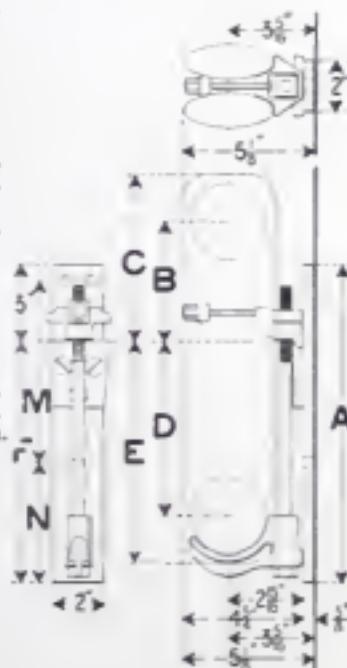
22 in. Radiator

A— $17\frac{3}{4}$  in.  
 B— $6\frac{3}{4}$  in. to  $8\frac{1}{4}$  in.  
 C— $7\frac{3}{4}$  in. to  $9\frac{3}{4}$  in.  
 D— $10\frac{1}{2}$  in. to  $12\frac{1}{2}$  in.  
 E—12 in. to 14 in.  
 F— $14\frac{3}{4}$  in.  
 M—11 in.  
 N—5 in.



No. 5 Bracket

Vertical adjustment.....2 in.  
 Horizontal adjustment....2 in.

Use  $\frac{3}{8}$  in. lag screws or No. 20 wood screws. (Not furnished.)

Specify Height (18 in. or 22 in.) of Radiator for which Brackets are Required.

## Radiator Brackets

### PRINCESS ADJUSTABLE WALL BRACKETS



No. 6 Bracket  
Vertical adjustment 2 in.  
Horizontal adjustment 2 in.

#### NO. 6 BRACKET

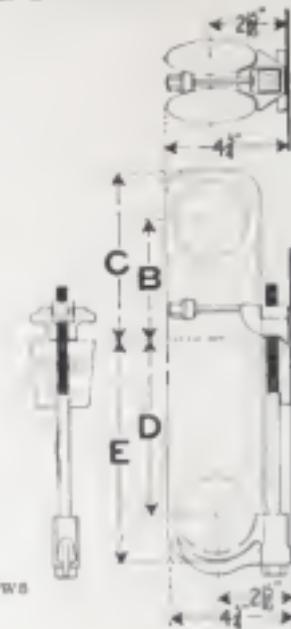
##### DIMENSIONS

###### 15 in. Radiator

B—5½ in. to 3¾ in.  
C—7¾ in. to 5¾ in.  
D—5¾ in. to 7¾ in.  
E—7¾ in. to 9¾ in.

###### 22 in. Radiator

B—6½ in. to 8½ in.  
C—7¾ in. to 9¾ in.  
D—10½ in. to 12½ in.  
E—12 in. to 14 in.



Use No. 20 Wood Screws

76



No. 7 Bracket  
Complete with ad  
justment screws.

#### NO. 7 BRACKET

##### DIMENSIONS

###### 15 in. Radiator

B—5½ in. to 3¾ in.  
C—7¾ in. to 5¾ in.  
D—5¾ in. to 7¾ in.  
E—7¾ in. to 9¾ in.  
L—13½ in.  
M—8 in.  
N—4 in.  
P—9½ in.  
X—5½ in. to 6½ in.  
Y—4½ in. to 4½ in.  
Z—1½ in. to 1½ in.



###### 22 in. Radiator

B—6½ in. to 8½ in.  
C—7¾ in. to 9¾ in.  
D—10½ in. to 12½ in.  
E—12 in. to 14 in.

L—18½ in.  
M—13 in.  
N—4 in.  
P—14½ in.

X—5½ in. to 6½ in.  
Y—4½ in. to 4½ in.  
Z—1½ in. to 1½ in.

Use  $\frac{3}{8}$  in. lag screws. (Not furnished).  
Vertical adjustment ..... 2 in. Horizontal adjustment ..... 2 in.  
Adjustment to uneven wall surface ..... 3 in.  
Specify Height (15 in. or 22 in.) of Radiator for which Brackets are required.

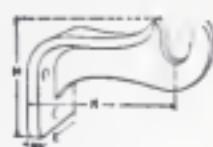
## Radiator Concealed Brackets



Brackets in Position

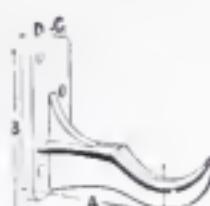


Steam



Water

## TOP BRACKETS



Steam or Water

## BOTTOM BRACKET

For Single, Two, Three and Five-Column Princess Radiators

77

## TOP BRACKET—STEAM AND WATER

DIMENSIONS IN INCHES

Style	Steam				Water			
	E	H	N	K	E	H	N	K
Single-Column Princess	3½	4¾	½	3½	3	4	½	3½
Two - Column Princess	3½	5½	½	4½	3	5½	½	4½
Three-Column Princess	3½	5½	½	5½	4	5½	½	5½
Five - Column Princess	4	5½	½	7	4	5½	½	7

## BOTTOM BRACKET—STEAM OR WATER

DIMENSIONS IN INCHES

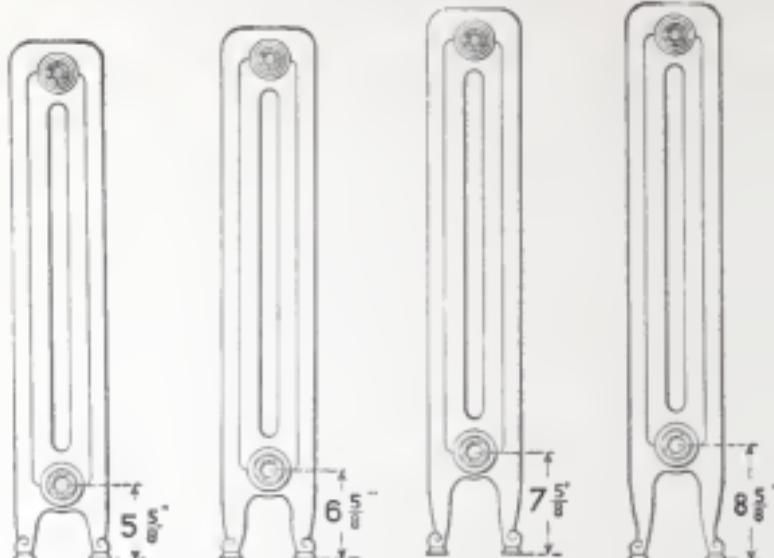
Style	A	B	C	D	Y	Z
Single-Column Princess	3½	5½	½	3	3½	6½
Two - Column Princess	4½	6	½	3	4½	8
Three-Column Princess	5½	6½	½	4	5½	10
Five - Column Princess	7	7	½	4	7	13

## Special Legs

**Legless Radiators** can be furnished in all heights and widths as listed on pages 61, 62, 63 and 64. Concealed brackets for supporting radiators without legs, see page 77.

1 in., 2 in. and 4 in. charged extra. 3 in., no extra charge.

78



1 in. Extra High 2 in. Extra High 3 in. Extra High 4 in. Extra High

Regular Radiators = 4 $\frac{1}{2}$  in. distance from Floor to center of tapping on all Princess Radiators, except 16 in., 14 in. and 12 in. Five-Column Princess.

Radiators can be furnished with extra high legs of any height if an even multiple of one inch (1 in.) is added to the regular height.

THREE-INCH (3 in.) EXTRA HIGH LEG is the extra height most commonly used. In ordering radiators with extra high legs specify the Extra Height of Leg required. NOT the total height of radiator or the distance from floor to center of tapping.

Example—Radiators to have 3 in. Extra High Legs.

### ADJUSTABLE RADIATOR FOOT REST



JENNISON—PATENTED DEC. 8, 1908

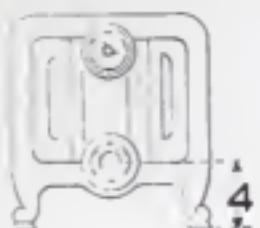
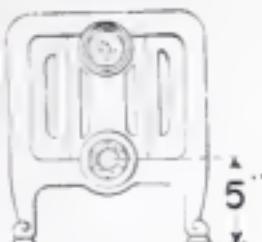
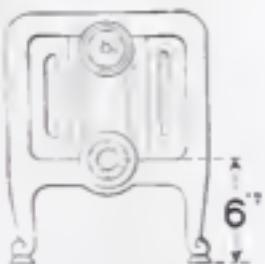
Number	Height, inches		List Price
	Closed	Open	
1	7/8	1 1/4	.20
2	1 1/4	1 5/8	.25
B3	1	1 3/8	.25
3	1 3/8	2 1/2	.30
4	2	3	.35
5	3	4	.40
6	4	5	.45

This Radiator Foot Rest consists of two iron blocks that open by turning the top piece. A substantial screw holds the two pieces, and allows the proper adjustment.

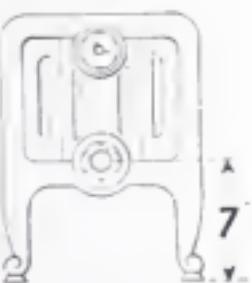
Shipped in plain iron.

## SPECIAL LEGS

16 in., 14 in., 12 in. Five-Column Princess

1 in. Extra High  
Extra charge2 in. Extra High  
Extra charge

3 in. Extra High

4 in. Extra High  
Extra charge

Regular Height



Regular Height

Regular 16 in., 14 in., 12 in. Princess Radiators = 3 in. distance from floor to center of tapping.

Height of all styles of Princess Radiators, except 16 in., 14 in., 12 in. Five-Column Princess can be reduced by cutting off the legs, not to exceed 3 in.

16 in., 14 in., 12 in. Five-Column Princess can be reduced by cutting off legs, not to exceed 1 in.

THREE-INCH (3 in) EXTRA HIGH LEG is the extra height most commonly used. In ordering radiators with extra high legs, specify the Extra Height of Leg required. NOT the total height of radiator or the distance from floor to center of tapping.

Example — Radiators to have 3 in. Extra High Legs.

**Regular Tappings \***

## STEAM, TWO-PIPE WORK

Radiators of 50 feet and smaller.....	1 in., $\frac{3}{4}$ in.
Radiators larger than 50 feet and smaller than 120 feet...120 feet	$1\frac{1}{4}$ in., 1 in.
Radiators of 120 feet and larger.....	$1\frac{1}{2}$ in., $1\frac{1}{4}$ in.
Air valve.....	$\frac{3}{8}$ in.

## STEAM, ONE-PIPE WORK

Radiators of 30 feet and smaller.....	1 in.
Radiators larger than 30 feet and smaller than 60 feet.....	$1\frac{1}{4}$ in.
Radiators of 60 feet and larger, and smaller than 120 feet.....	$1\frac{1}{2}$ in.
<b>80</b> Radiators of 120 feet and larger.....	2 in.
Air valve.....	$\frac{3}{8}$ in.

Radiators will be tapped for two-pipe work unless otherwise specified

## WATER

Radiators of 50 feet and smaller.....	1 in., 1 in.
Radiators larger than 50 feet and smaller than 120 feet...120 feet	$1\frac{1}{4}$ in., $1\frac{1}{4}$ in.
Radiators of 120 feet and larger.....	$1\frac{1}{2}$ in., $1\frac{1}{4}$ in.
Air valve—in top plug.....	$\frac{3}{8}$ in.

## SPECIAL NOTICE

If radiators are required tapped top and bottom same end, or top and bottom opposite ends, so specify on order.

Princess Wall Radiators, see page 70.

All tappings will be made Right Hand unless otherwise specified.

\* Tappings other than Regular can be made Special to order.

# Indirect Radiators

## Gold Pin



Steam Only—Intermediate Section  
REGULAR PATTERN  
10 Feet per Section



81

Steam or Water—Intermediate Section  
10-INCH FLANGE  
15 Feet per Section

### DIMENSIONS

Radiators	Regular Pattern	Ten Inch Flange
Distance from center to center.....in.	3 $\frac{3}{4}$	3 $\frac{3}{4}$
Free air space, per section.....sq. in.	41	38
Distance between ends of pins.....in.	$\frac{1}{4}$	$\frac{1}{4}$
Length of pin.....in.	$\frac{3}{4}$	$\frac{3}{4}$
Height of flange.....in.	10 $\frac{3}{4}$	14 $\frac{3}{4}$
Length of section.....in.	40 $\frac{1}{2}$	40 $\frac{1}{2}$
Height of section.....in.	7 $\frac{3}{4}$	10 $\frac{3}{4}$

### REGULAR TAPPINGS

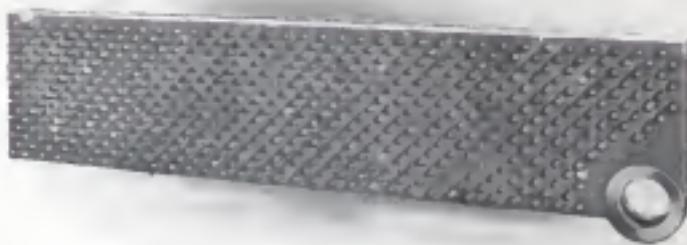
#### REGULAR PATTERN GOLD PIN

Supply....1 $\frac{1}{4}$  in.      Air valve..... $\frac{5}{8}$  in.      Return....1 $\frac{1}{4}$  in.

#### TEN INCH FLANGE GOLD PIN

Supply....1 $\frac{1}{2}$  in.      Air valve..... $\frac{5}{8}$  in.      Return....1 $\frac{1}{2}$  in.

## Twelve-Foot R. and L. Nipple Gold Pin



82

Intermediate Section

Steam Only

12 Feet per Section

### DIMENSIONS

Distance from center to center.....	3 $\frac{1}{4}$ in.
Free air space, per section.....	36 sq. in.
Distance between ends of pins.....	$\frac{3}{4}$ in.
Length of pin.....	$\frac{3}{4}$ in.
Height of section.....	9 in.
Length of section.....	36 in.
Size of R. & L. Nipple.....	2 in.

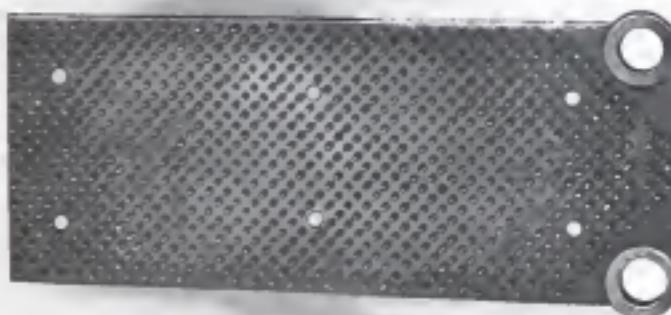
### REGULAR TAPPINGS

Supply.....1  $\frac{1}{2}$  in.      Air valve..... $\frac{3}{8}$  in.      Return.....1  $\frac{1}{2}$  in.  
Supply or Head Section is tapped L. H. for R. and L. Nipple.  
Return or Drain Section is tapped R. H. for R. and L. Nipple.

## R. and L. Nipple Gold Pin



15 Foot R. and L. Nipple Gold Pin



83

20 Foot R. and L. Nipple Gold Pin

Intermediate Sections

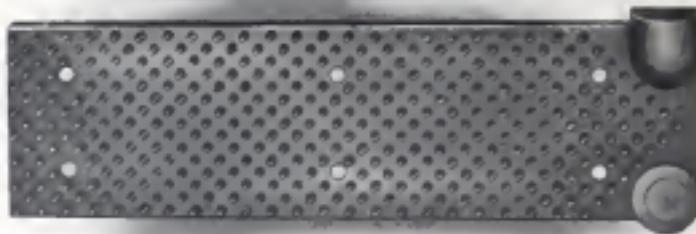
Steam or Water

## DIMENSIONS

Radiators	15 Feet	20 Feet
Distance from center to center.....in.	3 $\frac{1}{4}$	3 $\frac{1}{4}$
Free air space, per section.....sq. in.	36	36
Distance between ends of pins.....in.	$\frac{1}{4}$	$\frac{1}{4}$
Length of pin.....in.	$\frac{3}{4}$	$\frac{3}{4}$
Length of section.....in.	36	36
Height of section.....in.	11 $\frac{1}{2}$	15 $\frac{1}{2}$
Size of R. and L. Nipple.....in.	2	2

## REGULAR TAPPINGS

Supply.....2 in.      Air valve.....3 $\frac{1}{2}$  in.      Return.....2 in.  
 Supply or Head Section is tapped L. H. for R. and L. Nipple.  
 Return or Drain Section is tapped R. H. for R. and L. Nipple.

**School Pin**

15 Foot School Pin

84



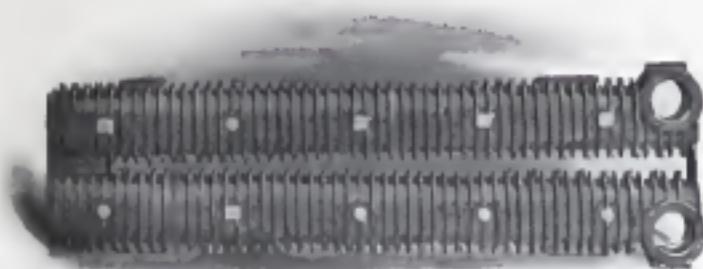
20 Foot School Pin  
 Supply and Return End Sections  
 Steam or Water  
 DIMENSIONS

Radiators	15 Feet	20 Feet
Distance from center to center..... in.	4	4
Free air space, per section..... sq. in.	61	61
Distance between ends of pins..... in.	½	½
Length of pin..... in.	1	1
Length of section..... in.	36	36
Height of section..... in.	11½	15½
Size of R. and L. Nipple..... in.	2	2

**REGULAR TAPPING**

Supply..... 2 in.      Air valve.....  $\frac{3}{8}$  in.      Return..... 2 in.  
 Supply or Head Section is tapped L. H. for R. and L. Nipple.  
 Return or Drain Section is tapped R. H. for R. and L. Nipple.

## Horizontal Aerial



15 Foot Aerial



85

## 20 Foot Aerial

Intermediate Sections

Steam or Water

## DIMENSIONS

Radiators	15 Feet	20 Feet
Distance between center of sections... in	3 $\frac{1}{2}$	3 $\frac{1}{2}$
Free air space, per section..... sq. in.	61	65
Distance between body of sections... in.	1 $\frac{1}{2}$	1 $\frac{1}{2}$
Length of extended surface..... in.	$\frac{1}{4}$	$\frac{1}{4}$
Height of section..... in.	11	15 $\frac{1}{4}$
Length of section..... in.	37	36 $\frac{1}{4}$
Size of R. and L. Nipple..... in.	2	2

## REGULAR TAPPING

Supply....2 in. R. H. Air valve.... $\frac{5}{8}$  in. Return....2 in. L. H.

When radiators are ordered tapped smaller than the above (2 in.) the female threads in bushings will be R. H.

# Breckenridge Automatic Air Valves

FOR

DIRECT AND INDIRECT RADIATORS



86

This cut illustrates a sectional view of the No. 4 Valve, but also shows the mechanical construction of all Breckenridge Automatic Air Valves.

## TO SET VALVE

Remove the plug and unscrew the valve so that the steam will flow out freely. After the valve has become thoroughly heated, close it lightly until the flow of steam stops (do not close the valve too hard on its seat), then screw in the plug and the valve will require no further attention.

These directions apply to all of the valves except No. 1, which is to be set with thumbscrew instead of with key.

Keys are furnished with valves.

Sectional View



No. 1

Cast Iron—Finished  
Black  
1/2 in. Connection



No. 2

Cast Iron—Finished  
Black  
3/4 in. Connection 3/4 in. Drip

Nos. 1 and 2 for Indirect Radiators

Air Valves

BRECKENRIDGE AUTOMATIC AIR VALVES

Nos. 3 to 14 inclusive for Direct Radiators



No. 3



No. 4



No. 5



No. 6



No. 7



No. 8



No. 9



No. 10



No. 11



No. 12



No. 13



No. 14



No. 6 Elbow  
Used with No. 6  
and 13 Valves



No. 7 Elbow  
Used with No. 7,  
10, 12 and 14  
Valves

All the above valves, Nos. 3 to 14 inclusive, are Brass Nickel-Plated and have  $\frac{1}{2}$  in. Connection.

Nos. 4, 6, 8 and 13 have  $\frac{1}{2}$  in. drips.









